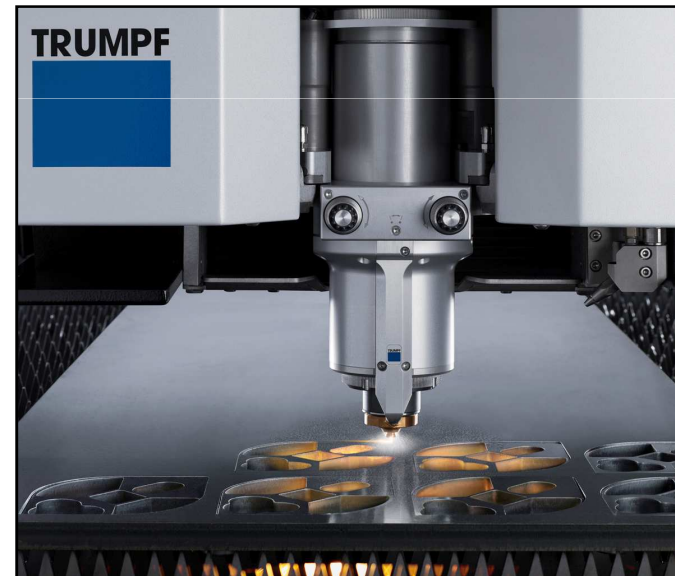




# **CoolLine: Increased process stability & more contour flexibility in thick mild steel**

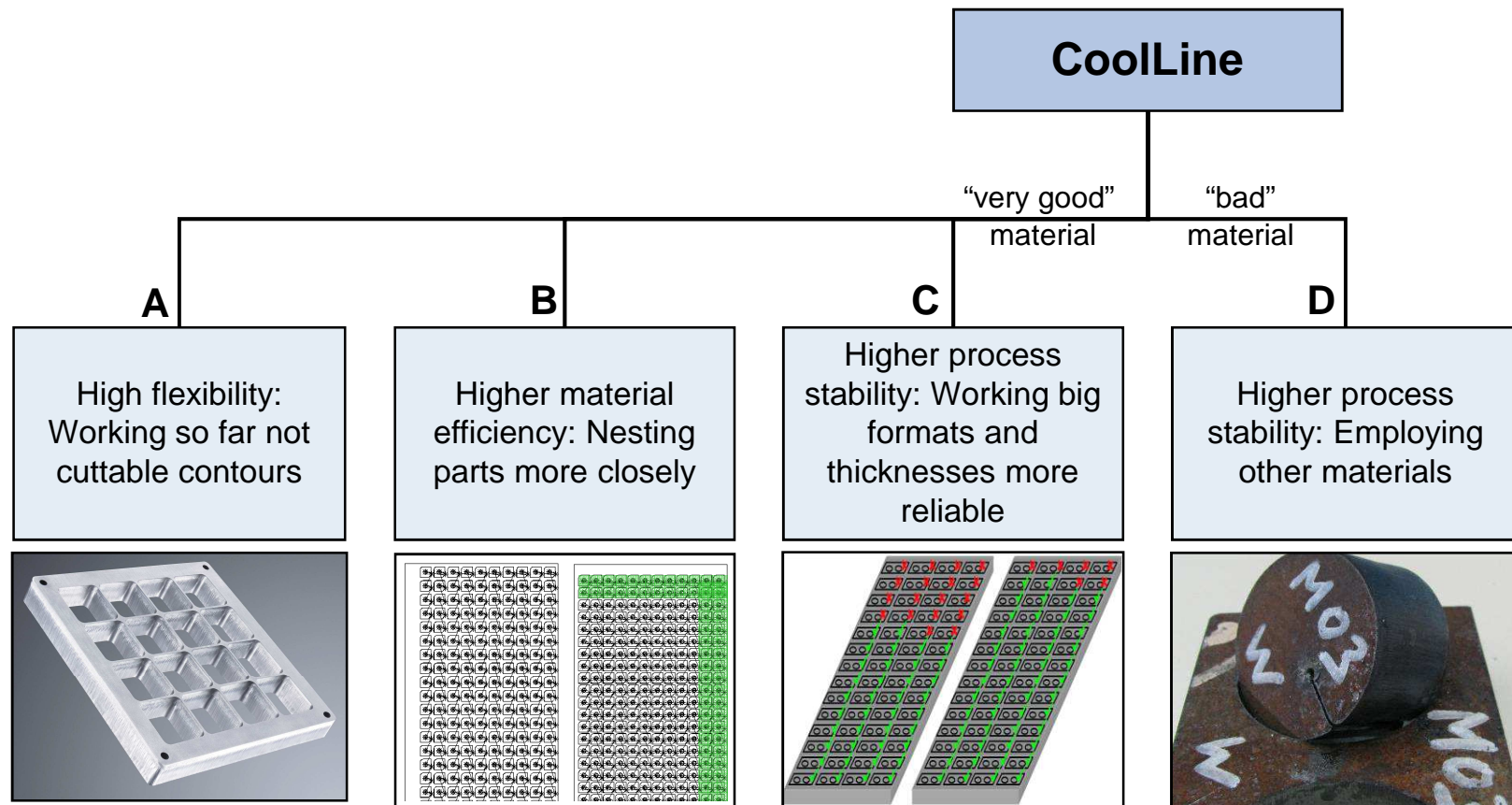
*Version 2*

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Ditzingen  
Oktober 2011





## Overview: CoolLine can be used in different ways.





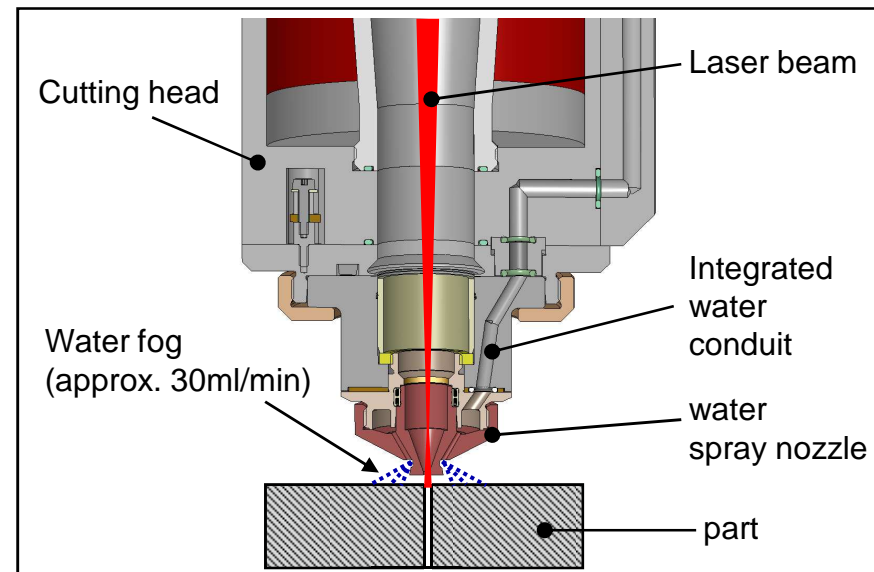
## Design and functionality.

### ▪ Functionality:

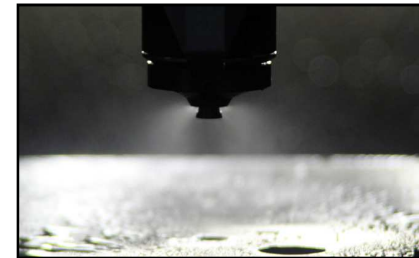
- Water is sprayed coaxial to the cutting process
- Cooling effect by boiled water (cooling power approx. 1kW at 30ml/min of water)

### ▪ Customer benefits:

- Increased process stability when cutting low quality material
- reduced material costs when cutting high quality material



Function principle with adopted cutting head and new nozzles.





## A) Higher flexibility: Thinking in new geometries.



### Reason for problem:

Small amounts of material (slats)  
collect lot of heat.

→ local overheating has a bad influence on  
the cutting process

### Result:

Filigree contours in higher sheet thickness  
are not possible to cut.

### Measure:

Local cooling with CoolLine

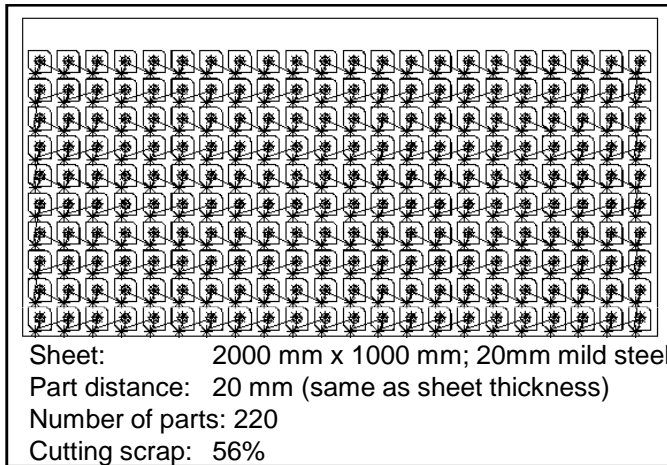
### Benefit:

Smaller slats are cuttable



## B) Higher material efficiency: Nesting parts more closely

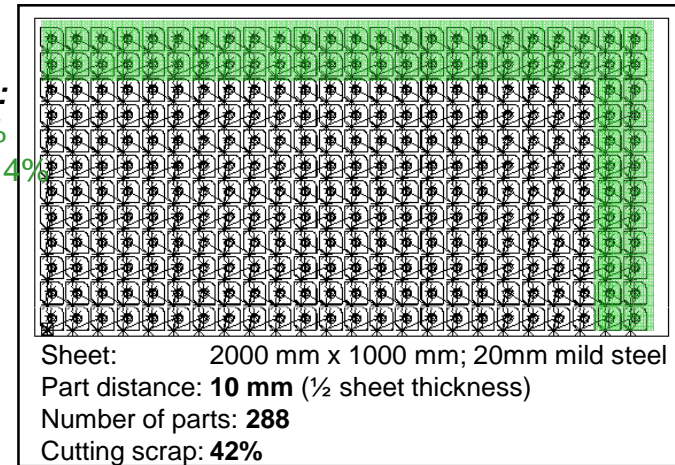
Example.



Example Sheet:

Parts: +31%

Cutting scrap: -14%



### Reason for problem:

Thick, big sheets collect heat.  
 → Increasing material overheating.

### Result:

Minimum distance at nesting is big,  
 furthermore segmenting big sheets  
 to obviate heat transfer

### Measure:

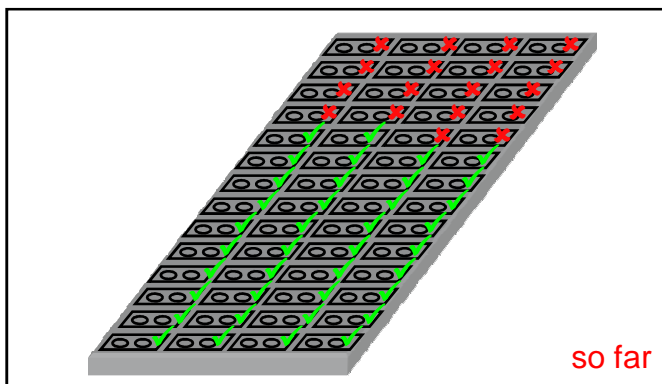
Local cooling with CoolLine

### Benefit:

Nesting more closely with high  
 quality material is possible.  
 → more material efficiency



## C) Higher process stability: Working big sheets and thicknesses more reliable

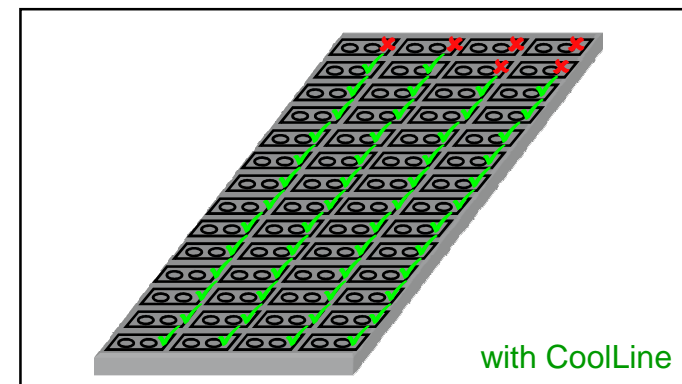


### Reason for problem:

Thick, big sheets collect heat.  
→ Increasing material overheating,  
process could be instable

### Result:

Rejects and higher material costs



### Measure:

Local cooling with CoolLine

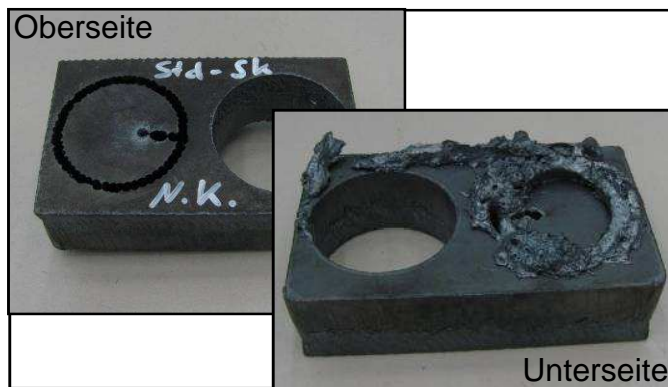
### Benefit:

Cutting with higher process  
stability and less rejects





## D) Higher process stability: Using other materials

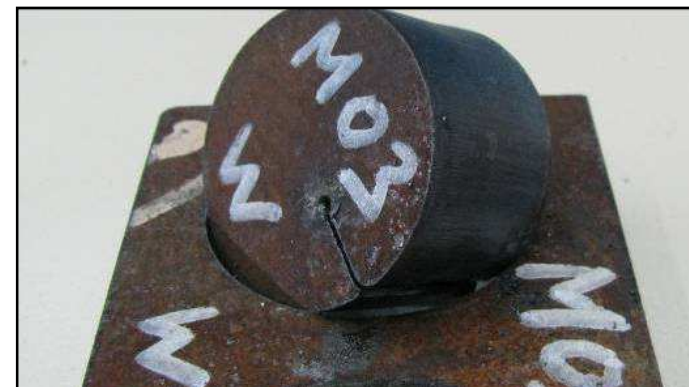


### Reason for problem:

Unsteady material configuration  
and different surfaces

### Result:

For high process stability in general only  
high quality and thus expensive material  
can be employed.



### Measure:

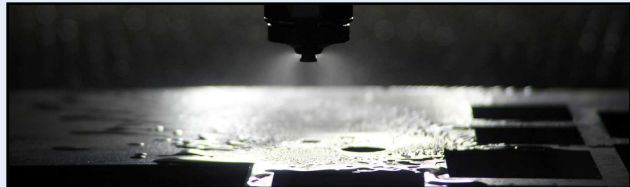
Local cooling with CoolLine

### Benefit:

Cutting of less expensive materials  
with higher process stability



## Differentiation: AdjustLine vs. CoolLine.

	<i>AdjustLine</i>	<i>CoolLine</i>
<b>Functionality</b>	<div> <p>ERHÖHTE MATERIALTOLERANZ &gt;</p> <p> <input checked="" type="radio"/> Aus           <input type="radio"/> Stufe 1           <input type="radio"/> Stufe 2         </p> </div> <ul style="list-style-type: none"> <li>„higher <b>material tolerance</b>“</li> <li>Adaption of standard cutting data via software</li> </ul>	 <ul style="list-style-type: none"> <li>„higher <b>material tolerance and material efficiency</b>“</li> <li>cooling of the process environment with water (special cutting head and special nozzles)</li> </ul>
<b>Application field</b>	<ul style="list-style-type: none"> <li><b>Mild steel</b> from 1mm to 20mm</li> <li><b>Stainless steel</b> from 1mm to 10mm</li> </ul>	<ul style="list-style-type: none"> <li>only <b>mild steel</b> from 15mm up to max. thickness</li> </ul>
<b>How to use when cutting <u>bad material</u>?</b>	<b>Step 1</b> when cutting low quality material	<b>Step 2</b> , if AdjustLine is not enough to ensure process stability. It is possible to combine CoolLine and AdjustLine in <b>step 3</b> .
<b>How to use for higher <u>material efficiency</u>?</b>		<b>Single possibility</b> for higher contour flexibility and more efficient nesting.





## What is included in CoolLine?

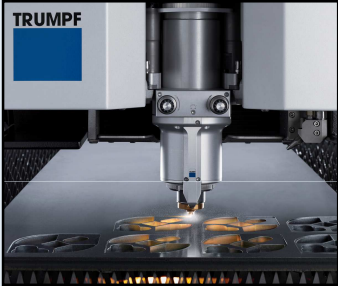
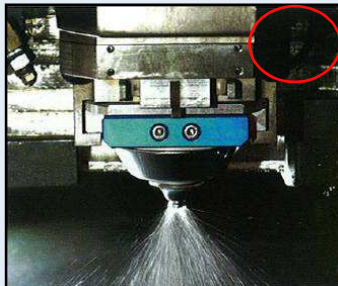
Option CoolLine includes:

- 1 separate cutting head with focal length 250mm  
(The machine identifies this cutting head as a CoolLine head. It has another ceramic body for the nozzle adaptor and can only be used for CoolLine)
- A total of 9 CoolLine-nozzles:
  - 9 nozzles with different diameters included in delivery extent (3 nozzles each: 1,4 / 2,0 / 2,3 mm)
  - Nozzles are not compatible with nozzle changer
- 1 water tank and water delivery to cutting head by UTI:  
The cutting head is changed like every cutting head, the water delivery is integrated in UTI (cutting head adapter).





## Benefit of CoolLine in competitive comparison

	<i>TRUMPF CoolLine</i>	<i>Amada WACS</i>
		
<b>Technical conversion</b>	Total integration in TRUMPF cutting head technology	No integration, external water leading by separate pipe (red mark in the picture above)
<b>Robustness / Wastage</b>	Integrated system	Separate pipe behind the working process (wear?)
<b>Collision protection</b>	existing	No solution known
<b>Rebuilding complexity</b>	Facile and very fast cutting head changing by UTI-serial interface	Not known in detail, but many different steps necessary