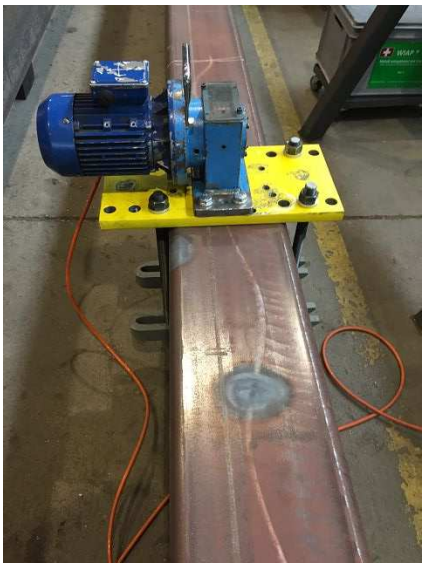
WIAP® MEMV®

Metall entspannen mit Vibration

Flame straightening with treatment according to the WIAP® MEMV® Process.

(MEMV® = Metal relax with vibration)



P1: Stable related MEMV® pathogens the component

Description of the flame straightening - process

This method is used for straightening deformed Components, correcting the delay of welding constructions and for directing and profiles large-area parts.
Also thin sheets like box structures, Machine beds, machine stand are typical Tasks for flame straightening.
A portion of the metal is determined by the acetylene limited oxygen flame locally heated. It occurs as a result of disabled Thermal expansion, a permanent squeezing of a. That is, it has between the zones of the discolored Area and the uncolored area a different voltage than the focus of Discoloration.
Thus, desired forms again getting produced.
In addition, flame straightening can to Molding are used.

P2: The component was directed flame-

It can, for example when welding a incurred Angular distortion are addressed, a slight bend be achieved by plates bending profiles strong, crooked steel plates or warped frame correct and even the diameter of cylinders decrease. (What safe only as a stopgap should be.)

P3: flame straightening point

When machining general structural steels,
fine grain and *austenitic* toughen
with a carbon content of more than 0.05% should be a
oxidizing flame be used.
The temperature of 650 ° C (red heat) should
are in this case not exceeded.

For aluminum and aluminum alloys should
the temperature no higher than 350 ° C to 400 ° C
and is dependent on material and alloy. in this connection
should be a neutral flame with light
Acetylene used.

P5: The component having a plurality of heating bodies by flame straightening.

Advantages of flame straightening - process.

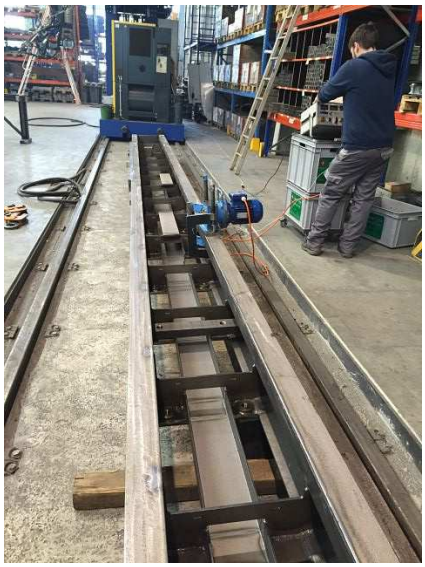
1. Unrivaled efficiency and effectiveness
   the oxy-acetylene flame
2. Faster and material gentle removal
   the workpiece delay
3. Clearing Schweissverzügen instead
   scrapping
4. For all metallic, weldable materials
   suitable (High-strength steels only suitable)
5. DVS - certified procedure for approval
   DIN EN 1090
6. High mobility. (Use without power supply
   possible)

However, flame straightening causes a new problem:
Namely the delay in processing.
Annealing after flame straightening result,
that the component in the original
warped position moves back. After this
new WIAP® MEMV® Method, there is no delay to the
Processing. that is theWIAP® MEMV® Relax
eliminated in the intermediate zones, where it passes through the
Flame straightening was red hot and the uncolored
Zone where a compression took place, tensions.
This, stresses generated by heat are,
distributed by the vibration margins so that between
the cold compression zones which by flame straightening
not revealed to the WIAP® MEMV® distributed process
and thus prevents a delay in the processing.

P6: The component loses scale by WIAP ®MEMV® process

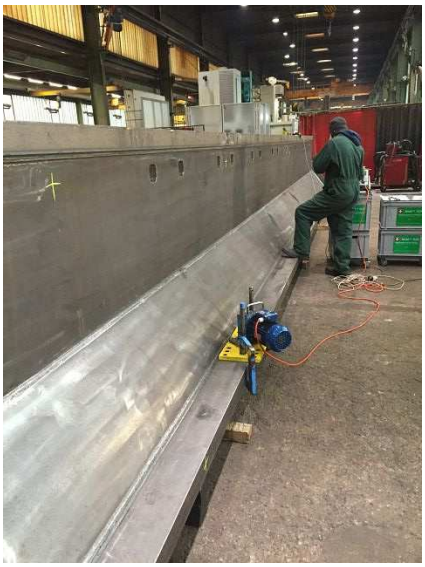
P8: Very important is a good rubber underlay. This should have a sufficient height so that no vibrations are transmitted in a factory building. In addition, the logging is accurate.

P7: The measuring probe records the process



P9: machine stand during relaxation process. This was also directed flame

P10: The WIAP® MEMV® The method solves many problems



P11: Even the heavy machinery sword in détente

P12: About 20 tons of the workpiece weight. The WIAP AG has facilities for 5, 20, 50, 100 and 200 tonnes

An alternative to the tension arm glow. Thanks to the new improved methods**WIAP® MEMV®** (Metal relax with vibration)

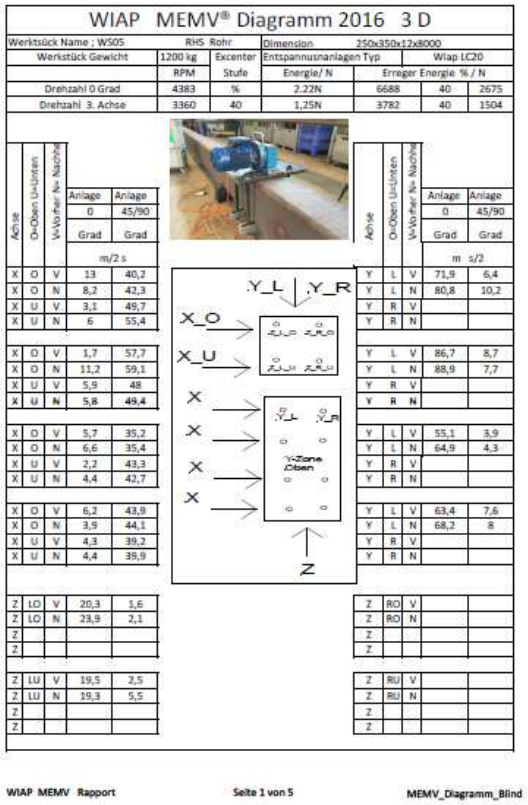
If we take a hot-rolled construction, which is warped by torsion and straightness in several mm, this flame judge, then bring in the annealing plant, the work comes after annealing, by the influence of heat, back into the warped base position.

With the **WIAP® MEMV®**Method, the flame directed workpiece vibrates. The achsspezifizierte Exzenterstufen setting allows the excitation process can also take place with a maximum speed without too extreme deflection occurs. All axes are touched. With 24 measuring points the exact course and the changes are determined and recorded. When drauffolgenden machining the workpiece is not slow. That is, the vibration can relax now with the MEMV® relaxation method, advantages over the glow, because balance the tensions.

The merit of MEMV® WIAP® procedure summarized:

- Set up a component and edit it, it warps.
- Set up a device, it vibrates to the new **WIAP® MEMV®** Method, there is no after processing delay.
- Set up a component and enter it in the annealing plant; disfiguration it again. To set again, edit it and warp again.

This new and improved **WIAP® MEMV®** The method is the key to why the metal relax with vibration has an advantage compared to the annealing.



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Werkstück Name ; WS05		RHS Rohr		Dimension	250x350x12x8000		
Werkstück Gewicht		1200 kg	Excenter	Entspannusnanlagen Typ		Wiap LC20	
		RPM	Stufe	Energie/ N	Erreger Energie % / N		
Drehzahl 0 Grad		4383	%	2.22N	6688	40	2675
Drehzahl 3. Achse		3360	40	1,25N	3782	40	1504

Achse	O=Oben U=Unten	V=Vorher N= Nachher	Anlage 0 Grad m/2 s	Anlage 45/90 Grad
X	O	V	13	40,2
X	O	N	8,2	42,3
X	U	V	3,1	49,7
X	U	N	6	55,4
X	O	V	1,7	57,7
X	O	N	11,2	59,1
X	U	V	5,9	48
X	U	N	5,8	49,4
X	O	V	5,7	35,2
X	O	N	6,6	35,4
X	U	V	2,2	43,3
X	U	N	4,4	42,7
X	O	V	6,2	43,9
X	O	N	3,9	44,1
X	U	V	4,3	39,2
X	U	N	4,4	39,9
Z	LO	V	20,3	1,6
Z	LO	N	23,9	2,1
Z				
Z				
Z	LU	V	19,5	2,5
Z	LU	N	19,3	5,5
Z				
Z				

Achse	O=Oben U=Unten	V=Vorher N= Nachher	Anlage 0 Grad m s/2	Anlage 45/90 Grad
Y	L	V	71,9	6,4
Y	L	N	80,8	10,2
Y	R	V		
Y	R	N		
Y	L	V	86,7	8,7
Y	L	N	88,9	7,7
Y	R	V		
Y	R	N		
Y	L	V	55,1	3,9
Y	L	N	64,9	4,3
Y	R	V		
Y	R	N		
Y	L	V	63,4	7,6
Y	L	N	68,2	8
Y	R	V		
Y	R	N		
Z	RO	V		
Z	RO	N		
Z				
Z				
Z	RU	V		
Z	RU	N		
Z				
Z				

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It is also important to know that it has been stated that the vibrational relaxation locally to zones, not only heat, but also with vibrations, stresses degrades specifically controlled so that no reset delay a directional component takes place.

However, it is very important to carry out a 100% controlled vibration relaxation. It takes a very good attachment between the component and the pathogen. The introduction of energy direction plays an important role. The in one component always present dead centers must resp determined. are always well attended.

The following protocol shows the current measurement in the process according WIAP® MEMV®,

It is a component today considering 24 measuring points, so that the change between before and after in many places is determined. The difference we measured after about 90 seconds. The biggest stress relief is, however, at the very first load cycles. This we collect but not currently. The advanced detection method is with us in preparation.

WIAP MEMV® Diagramm 2016 3 D

X Achse

X Achse oben 0 Grad vorher	10,4	10,2	8,9	20,7	
X Achse oben 0 Grad nachher	12,5	13	9,8	21,3	
Differenz oben	2,1	2,8	0,9	0,6	6,4
X Achse unten 0 Grad vorher	13,6	7,9	8,2	15,2	
X Achse unten 0 Grad nachher	15,4	9,7	9	15,5	
Differenz unten	1,8	1,8	0,8	0,3	4,7
X Achse oben 3. Achse vorher	53,6	59,8	38,8	50,8	
X Achse oben 3. Achse nachher	51,7	63,5	38,6	52,3	
Differenz oben	-1,9	3,7	-0,2	1,5	7,3
X Achse unten 3 Achse vorher	62,4	56,5	44	45,6	
X Achse unten 3. Achse nachher	60,3	55,8	44,6	46,2	
Differenz unten	-2,1	-0,7	0,6	0,6	4

Y Achse

Y Achse oben 0 Grad vorher	66,4	41,7	41,7	57	
Y Achse oben 0 Grad nachher	73,5	79,5	47,5	68,4	
Differenz oben	7,1	37,8	5,8	11,4	62,1
Y Achse 3. Achse vorher	6,8	8,5	3,5	3,1	
Y Achse 3. Achse nachher	6,3	7	3,8	5,5	
Differenz unten	-0,5	-1,5	0,3	2,4	
					4,7

Z Achse

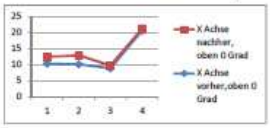
Z Achse oben 0 Grad vorher	21,3	12,1	0	0	
XZAchse oben 0 Grad nachher	28	9,2	0	0	
Differenz oben	6,7	-2,9	0	0	9,6
Z Achse 3. Achse vorher	3,1	13,2	0	0	
Z Achse 3. Achse nachher	5,9	1,9	0	0	
Differenz unten	2,8	-11,3	0	0	
					14,1

Veränderung Total 0 Grad	82,8	m s/2
Veränderung Total 3. Achse	27,5	m s/2
Total Veränderung	110,3	m s/2

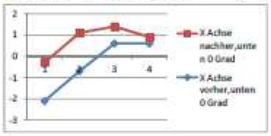
Total Anzahl Messpunkte				20
Vermessen an diesem Werkstück	8 x X	4 x Y	2 x Z	14

WIAP MEMV® Diagramm 2016 3 D

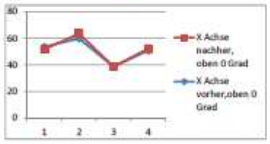
X Achse oben 0 Grad — Differenz Verschiebung 6,4 m s/2



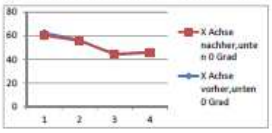
X Achse unten 0 Grad — Differenz Verschiebung 4,7 m s/2



X Achse Oben 3. Achse — Differenz Verschiebung 7,3 m s/2



X Achse unten 3. Achse — Differenz Verschiebung 4 m s/2



WIAP MEMV® Diagramm 2016 3 D

X Achse

X Achse oben 0 Grad vorher	10,4	10,2	8,9	20,7	
X Achse oben 0 Grad nachher	12,5	13	9,8	21,3	
Differenz oben	2,1	2,8	0,9	0,6	6,4
X Achse unten 0 Grad vorher	13,6	7,9	8,2	15,2	
X Achse unten 0 Grad nachher	15,4	9,7	9	15,5	
Differenz unten	1,8	1,8	0,8	0,3	4,7
X Achse oben 3. Achse vorher	53,6	59,8	38,8	50,8	
X Achse oben 3. Achse nachher	51,7	63,5	38,6	52,3	
Differenz oben	-1,9	3,7	-0,2	1,5	7,3
X Achse unten 3 Achse vorher	62,4	56,5	44	45,6	
X Achse unten 3. Achse nachher	60,3	55,8	44,6	46,2	
Differenz unten	-2,1	-0,7	0,6	0,6	4

Y Achse

Y Achse oben 0 Grad vorher	66,4	41,7	41,7	57	
Y Achse oben 0 Grad nachher	73,5	79,5	47,5	68,4	
Differenz oben	7,1	37,8	5,8	11,4	62,1
Y Achse 3. Achse vorher	6,8	8,5	3,5	3,1	
Y Achse 3. Achse nachher	6,3	7	3,8	5,5	
Differenz unten	-0,5	-1,5	0,3	2,4	
					4,7

Z Achse

Z Achse oben 0 Grad vorher	21,3	12,1	0	0	
XZAchse oben 0 Grad nachher	28	9,2	0	0	
Differenz oben	6,7	-2,9	0	0	9,6
Z Achse 3. Achse vorher	3,1	13,2	0	0	
Z Achse 3. Achse nachher	5,9	1,9	0	0	
Differenz unten	2,8	-11,3	0	0	
					14,1

Veränderung Total 0 Grad	82,8	m s/2
Veränderung Total 3. Achse	27,5	m s/2
Total Veränderung	110,3	m s/2

Total Anzahl Messpunkte				20
Vermessen an diesem Werkstück	8 x X	4 x Y	2 x Z	14

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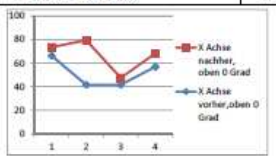
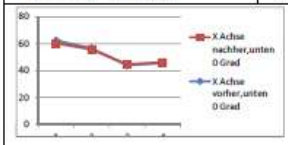
WIAP MEMV® Diagramm 2016 3 D

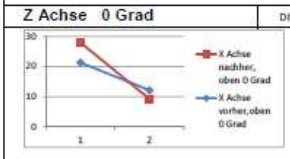
Y Achse 0 Grad — Differenz Verschiebung 62,1 m s/2



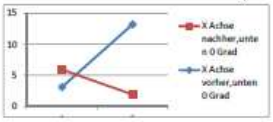
Y Achse 3. Achse — Differenz Verschiebung 4,7 m s/2



Z Achse 0 Grad — Differenz Verschiebung 9,6 m s/2



Z Achse 3. Achse — Differenz Verschiebung 14,1 m s/2



WIAP MEMV® Diagramm 2016 3 D

Exzenter Erreger Tabelle WIAP LC System 100%

Drehzahl	Einzel Scheibe	Doppel Scheibe	Einzel Scheibe	Doppel Scheibe	Einzel Scheibe	Doppel Scheibe	Einzel Scheibe	Doppel Scheibe	Einzel Scheibe	Doppel Scheibe
	LC05 bis 5 Tonne		LC20 bis 20 Tonnen		LC50 bis 50 Tonnen		LC100 bis 100 Tonnen		LC200 bis 200 Tonnen	
RPM	N		N		N		N		N	
1000	55	110	209	418	418	836	1045	2090	2090	4180
1500	124	248	470	940	940	1880	2352	4704	4704	9408
2000	220	440	836	1672	1672	3344	4181	8362	8362	16724
2500	345	690	1306	2612	2612	5224	6531	13066	13066	26132
3000	497	994	1881	3762	3762	7524	9407	18814	18814	37628
3500	676	1352	2561	5122	5122	10244	12805	25610	25610	51220
4000	883	1766	3344	6688	6688	13376	16725	33450	33450	66900
4500	1118	2236	4233	8466	8466	16932	21167	42334	42334	84668
5000	1380	2760	5226	10452	10452	20904	26132	52264	52264	104528
5500	1670	3340	6324	12648	12648	25296	31620	63240	63240	126480
6000	1988	3976	7526	15052	15052	30104	37630	75260	75260	150520
6500	2333	4666	8832	17664	17664	35328	44164	88328	88328	176656
7000	2706	5412	10244	20488	20488	40976	51219	102438	102438	204876

Protokolle Erstellung HPW 20.02.2016

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Where tensions go towards the MEMV® process? The not relax with heat but vibration?

regarding the question where to go toward the tension, I would like to answer briefly.
Flame-looking components generated by the introduction of a local thermal stress state of communicating with the environment in balance.
If this component is annealed arises through a free deformation, a new state of tension, and the component is crooked. was the case of a flame-directed component which are overlaid by local equilibrium states that the macroscopic equilibrium states straightened, these local equilibrium states are disturbed by the processing and the component passes through a deformation in a new state of equilibrium.
If the component is annealed in a clamped state and cooled clamped slow the global tensions in balance and subsequent processing will not have a major influence on the straightness.
When vibrate in the clamped state in several directions, the stresses in the global state are brought into balance, and the component can be edited. The voltages are not only on the surface but also in a greater depth in equilibrium.

I hope to have explained to you with this short version, where the tension go.

Created: Iris, Sven and HP Widmer
Answer where tensions go towards the MEMV® method response from Prof. Schmid

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