

Stainless hollow sections of Lean Duplex material

STALA TUBE

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Agenda

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- Products / Business Areas
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The company



Stalatable Oy

- Turnover Year 2007 85 million €
- Foreign operations over 90% of turnover
- Personnel 110
- Head Office and Production plant in Lahti, Finland
 - 11 welding lines
- Sales units
 - Stalatable B.V. Zevenbergen, Holland
 - Stalatable Inc. Philadelphia, USA

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Products and Business Areas



Products

- Square hollow sections 25 x 25 - 300 x 300 mm
- Rectangular hollow sections 30 x 20 - 400 x 200 mm
- Thicknesses from 1.2 to 12.5 mm

Business Areas :

- Process machinery
- Construction and architectural design
- Offshore and marine
- Transport engineering
- Food and pharmaceutical industries

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Materials **STALE**
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Austenitic stainless steel grades:

- EN 1.4301 - 304
- EN 1.4307 - 304L
- EN 1.4541 - 321
- EN 1.4401 - 316
- EN 1.4404 - 316L
- EN 1.4571 - 316Ti

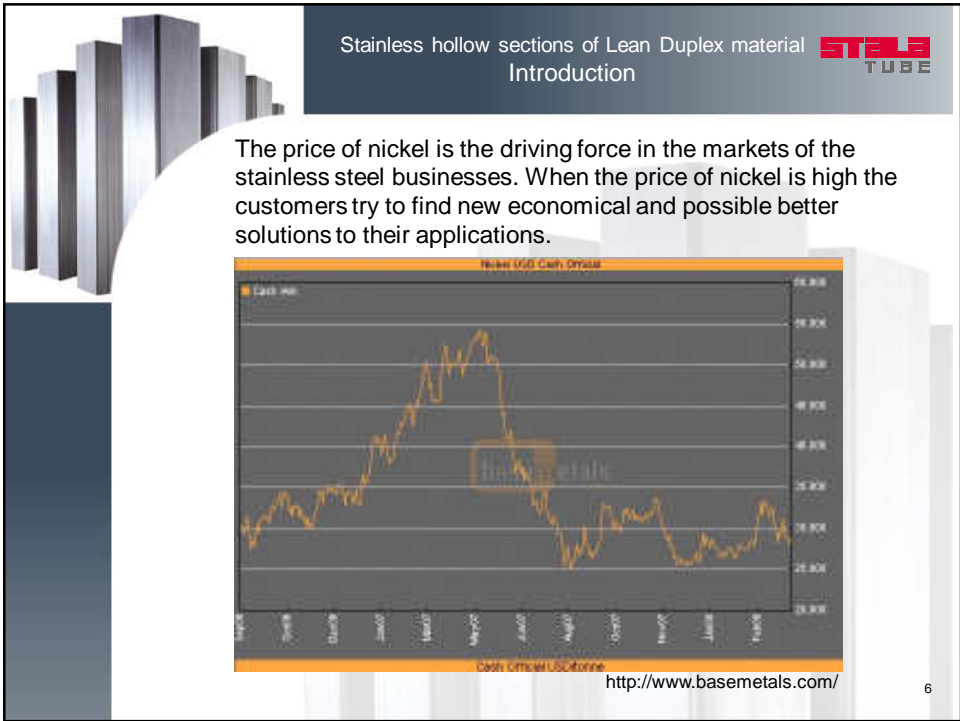
Duplex

- EN 1.4162 - LDX 2101

Ferritic stainless steel grade:

- EN 1.4003


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Stainless hollow sections of Lean Duplex material **STALE**
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Introduction

The price of nickel is the driving force in the markets of the stainless steel businesses. When the price of nickel is high the customers try to find new economical and possible better solutions to their applications.



<http://www.basemetals.com/>

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The content of the RUOPUM-project

Product family	Name	Steel Grades	
		1	Ferritic
2	Duplex	EN 1.4162	EN 1.4462
3	Cr-Mn Steels 200-series	"1% Ni"	EN 1.4372 "3,5 - 5,5 % Ni"

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- Excellent combination of strength and corrosion resistance
- High resistance to uniform, pitting and crevice corrosion
- Good stress corrosion resistance
- High strength => cost savings
- Good fatigue resistance
- Good weldability
- Price stability (Lean Duplex)

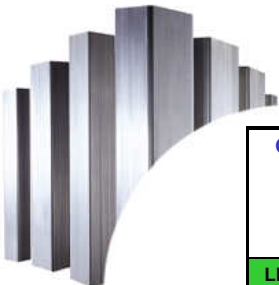
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Stainless hollow sections of Lean Duplex material **STALE**
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Chemical composition

Grade	EN	C %	Mn %	N %	Cr %	Ni %	Mo %
LDX 2101	1.4162	Max 0,040	4,00-6,00	Min 0,20	21,00-22,00	1,35-1,70	Min 0,10
2304	1.4362	Max 0,030	Max 2,00	0,05-0,20	22,00-24,00	3,50-5,50	0,10-0,60
2205	1.4462	Max 0,030	Max 2,00	0,10-0,22	21,00-23,00	4,50-6,50	2,50-3,50
304 L	1.4307	Max 0,030	Max 2,00	Max 0,11	17,50-19,50	8,00-10,00	-
316 L	1.4404	Max 0,030	Max 2,00	Max 0,11	16,50-18,50	10,00-13,00	2,00-2,50

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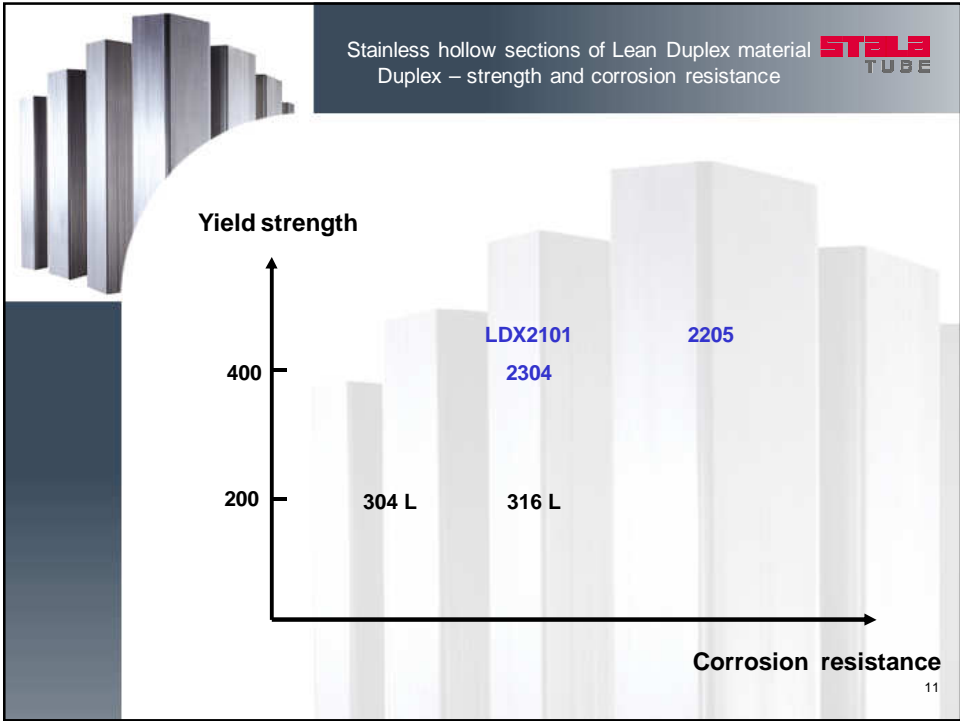


Stainless hollow sections of Lean Duplex material **STALE**
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Mechanical properties

Grade	EN	Yield strength Rp0,2 [MPa] ¹⁾	Tensile strength Rm [MPa] ¹⁾	Elongation A5 [%] ²⁾
LDX 2101	1.4162	Min 450	Min 650	Min 30
2304	1.4362	Min 400	600-850	Min 20
2205	1.4462	Min 460	660-950	Min 25
304 L	1.4307	Min 200	520-670	Min 45
316 L	1.4404	Min 220	530-680	Min 40

¹⁾ Hot-rolled, annealed condition
²⁾ A80 when T < 3 mm

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Stainless hollow sections of Lean Duplex material **STALE TUBE**
 Actual test results

Yield strenght , Tensile strength, Elongation and Charpy – V

LDX	H [mm]	B [mm]	t [mm]	R _{p0,2} [MPa]	R _m [MPa]	A ₅ [%]	Charpy-V [J] -20° C	Charpy-V [J] -40° C
1	50	50	2	693	873	28,5	23	23
2	70	50	2,5	672	819	32,5	36	33
3	60	60	3	736	849	25,5	34	35
4	80	40	4	686	828	28	50	45
5	80	80	4	732	855	25,5	50	44
6	150	150	6	563	749	37,5	66	61

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Stainless hollow sections of Lean Duplex material **STALE**
LDX2101 Square dimensions **TUBE**

	1,5	2,0	3,0	4,0	5,0	6,0
25x25	█	█				
30x30	█	█				
32x32	█	█				
35x35	█	█				
38x38	█	█				
40x40	█	█				
50x50	█	█				
60x60	█	█	█	█		
70x70		█	█	█		
80x80		█	█	█		
100x100		█	█	█		
120x120			█	█		
150x150			█	█	█	█
200x200				█	█	█
250x250				█	█	█
300x300				█	█	█

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Stainless hollow sections of Lean Duplex material **STALE**
LDX2101 Rectangular dimensions **TUBE**

	1,5	2,0	3,0	4,0	5,0	6,0		1,5	2,0	3,0	4,0	5,0	6,0
30x20	█	█					100x50		█	█	█		
40x20	█	█					100x60		█	█	█		
40x30	█	█					120x40		█	█	█		
50x20	█	█					150x100		█	█	█		
50x25	█	█					200x100			█	█	█	█
50x30	█	█					250x150			█	█	█	█
50x40	█	█					300x100			█	█	█	█
60x20	█	█					300x200				█	█	█
60x30	█	█					400x200				█	█	█
60x40	█	█											
70x50	█	█	█										
80x40	█	█	█	█									
80x60		█	█	█									
100x40		█	█	█									

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Stainless hollow sections of Lean Duplex material
Applications for Duplex grades



- Chemical & petrochemical industry
- Pulp and paper industry
- Power generation
- Off- and onshore
- Transportation industry
- Building industry



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Reference Nokia headquarters



