

Permissible variations on dimensions

ASTM A 53		
Permissible Variations of Dimension over 60,3 mm (including)	± 1 %	
Permissible Variations of Wall thickness	- 12.5 %	
Permissible Variations of Weight	Weight in the dimensional standard ASME B36.10M can not differ by more than ±10 %	
ASTM A 106		
Outside diameter (mm)	Permissible Variations of Outside diameter	
	upper	lower
	mm	mm
from 48,3 to 114,3 (including)	+ 0.8	- 0.8
from 114,3 to 219,1 (including)	+ 1.6	- 0.8
from 219,1 to 457 (including)	+ 2.4	- 0.8
Permissible Variations of Wall thickness	- 12.5 %	
Permissible Variations of Weight	+ 10 % / - 3.5 %	
ASTM A 450		
Outside diameter (mm)	Permissible Variations of Outside diameter	
	over	under
seamless hot rolled tubes		
up to 101,6 (including)	+ 0.4	- 0.8
from 101,6 to 190,5 (including)	+ 0.4	- 1.2
from 190,5 to 228,6 (including)	+ 0.4	- 1.6
Permissible Variations of Wall thickness		
Outside diameter (mm)	Wall thickness %	
	over 4,6	
seamless hot rolled tubes		
up to 101,6 (including)	+ 28 / - 0	
over 101,6	+ 28 / - 0	
Production	Permissible Variations of Weight per feet, %	
	over	under
seamless hot rolled tubes	+ 16	- 0
ASTM A 530		
Outside diameter (mm)	Permissible Variations of Outside diameter	
	upper	lower
	mm	mm
from 48.3 to 114.3 (including)	+ 0.8	- 0.8
from 114.3 to 219.1 (including)	+ 1.6	- 0.8
from 219.1 to 457 (including)	+ 2.4	- 0.8
Permissible Variations of Wall thickness		- 12.5 %
Permissible Variations of Weight		
up to ø 323.8 mm (including)	+ 10 % / - 3.5 %	
over ø 323.8 mm	+ 10 % / - 5 %	
DIN 1629, 1630		
Permissible Variations of Outside diameter		
Outside diameter (mm)	Permissible Variations	Tube end
≤ 100	± 1 % D (but ± 0.5 mm is allowed)	± 0.4 mm
100 < D ≤ 200	± 1 % D	± 0.5 % D
> 200	± 1 % D	± 0.6 % D
Permissible Variations of Wall thickness		
D ≤ 130 mm	t ≤ 2 *t _n	+ 15 % / - 10 %
	2*t _n < t ≤ 4*t _n	+ 12.5 % / - 10 %
	t > 4 *t _n	± 9 %

130 < D ≤ 320 mm 320 < D ≤ 660 mm	t ≤ 0.05 D	+ 17.5 % / - 12.5 %
	0.05 D < t ≤ 0.11 D	± 12.5 %
	t > 0.11 D	± 10 %
	t ≤ 0.05 D	+ 20 % / - 15 %
	0.05 D < t ≤ 0.09 D	+ 15 % / - 12.5 %
	t > 0.09 D	+ 12.5 % / - 10 %
*t _n – basic wall thickness according to DIN 2448		
Permissible Variations of Weight		
for individual tubes		+ 12 % / - 8 %
for delivery of at least 10 tons		+ 10 % / - 5 %
DIN 17 121		
Permissible Variations of Outside diameter		± 1 % (but ± 0.5 mm is allowed)
Permissible Variations of Wall thickness		the same as according to DIN 1629
Permissible Variations of Weight		
for individual tubes		+ 12 % / - 8 %
for delivery of at least 10 tons		+ 10 % / - 5 %
DIN 17 172		
Outside diameter (mm)	Permissible Variations of Outside diameter	
	Tube	Tube end
< 200	± 1 % D (max. ± 0.5 mm)	± 1 % D (max. ± 0.5 mm) possible to agree ± 0.5 % D (max. ± 0.4 mm)
200 ≤ D < 500 500 ≤ D < 1200	± (0.4%D+1mm) ± 0.5 % D (max. ± 5 mm)	± 0.7 % D ± 1.6 mm
Permissible Variations of Wall thickness		
for D ≤ 130 mm		± 10 %
for D > 130 mm		± 12.5 %
On various parts wall thickness can fall under by about 0,5 %, but only in lengths shorter than twice the outside diameter of the tube (max. 300 mm).		
Permissible Variations of Weight		
for individual tubes		+ 10 % / - 8.5 %
for waggon delivery of at least 10 tons		± 7.5 %
DIN 17 173		
Outside diameter (mm)	Permissible Variations of Outside diameter	
	Tube	Tube end
< 100	± 1 % D (max. ± 0.5 mm)	max. ± 0.4 mm
100 ≤ D < 200	± 1 % D	± 0.5 % D
D > 200	± 1 % D	± 0.6 % D
Permissible Variations of Wall thickness		
D ≤ 130 mm	t ≤ 2 * t _n	+ 15 % / - 10 %
	2 * t _n < t ≤ 4 * t _n	+ 12.5 % / - 10 %
	t > 4 * t _n	± 9 %
130 < D ≤ 320	t ≤ 0.05 D	+ 17.5 % / - 12.5 %
mm	0.05 D < t ≤ 0.11 D	± 12.5 %
	t > 0.11 D	± 10 %
	320 < D ≤ 660	+ 22.5 % / - 12.5 %
mm	t ≤ 0.05 D	+ 15 % / - 12.5 %
	0.05 D < t ≤ 0.09 D	- 12.5 %
	t > 0.09 D	+ 12.5 % / - 10 %
	t _n – basic wall thickness according to DIN 2448	
Permissible Variations of Weight		
for individual tubes		+ 12 % / - 8 %
for waggon delivery of at least 10 tons		+ 10 % / - 5 %

DIN 17 175		
Outside diameter	Permissible Variations	
$D \leq 100 \text{ mm}$	$\pm 0.75 \%$ (but at least $\pm 0.5 \text{ mm}$)	
$100 < D \leq 320 \text{ mm}$	$\pm 0.9 \%$	
$D > 320 \text{ mm}$	$\pm 1 \%$	
Permissible Variations of Wall thickness		
$D \leq 130 \text{ mm}$	$t \leq 2 * t_n$	$+ 15 \%$ / $- 10 \%$
	$2 * t_n < t \leq 4 * t_n$	$+ 12.5 \%$ / $- 10 \%$
	$t \geq 4 * t_n$	$\pm 9 \%$
$130 < D \leq 320 \text{ mm}$	$t \leq 0.05 D$	$+ 17.5 \%$ / $- 12.5 \%$
	$0.05 D < t \leq 0.11 D$	$\pm 12.5 \%$
	$t > 0.11 D$	$\pm 10 \%$
$320 < D \leq 660 \text{ mm}$	$t \leq 0.05 D$	$+ 22.5 \%$ / $- 12.5 \%$
	$0.05 D < t \leq 0.09 D$	$+ 15 \%$ / $- 12.5 \%$
	$t > 0.09 D$	$+ 12.5 \%$ / $- 10 \%$
t_n – basic wall thickness according to DIN 2448		
Permissible Variations of Weight		
for individual tubes		$+ 10 \%$ / $- 8 \%$
for waggon delivery of at least 10 tons		$\pm 7.5 \%$
DIN 17 176		
Permissible Variations of Outside diameter		according to DIN 17 175
Permissible Variations of Wall thickness		according to DIN 1629
DIN 17 204		
Permissible Variations of Outside diameter	$\pm 1 \%$ (but $\pm 0.5 \text{ mm}$ is allowed)	
Permissible Variations of Wall thickness	$- 12.5 \%$ (upper limit is done by allowed permissible variation of weight)	
Permissible Variations of Weight		
for individual tubes		$+ 12 \%$ / $- 8 \%$
for waggon delivery of at least 10 tons		$+ 10 \%$ / $- 5 \%$
EN 10 208-2		
Outside diameter (mm)	Permissible Variations of Outside diameter	
	Tube	Tube end
$D \leq 60$	$\pm 0.5 \text{ mm}$ or $\pm 0.75 \%$	$\pm 0.5 \text{ mm}$ or $\pm 0.5 D$
$60 < D \leq 610$	(higher value is always valid)	(higher value is always valid) not more than $\pm 1.6 \text{ mm}$
Wall thickness	Permissible Variations of Wall thickness	
$t \leq 4$	$+ 0.6 \text{ mm}$ / $- 0.5 \text{ mm}$	
$4 < t < 25$	$+ 15 \%$ / $- 12.5 \%$	
$t \geq 25$	$+ 3.75 \text{ mm}$ / $- 3.0 \text{ mm}$ or $\pm 10 \%$ (higher value is always valid)	
Permissible Variations of Weight		
for individual tube		$+ 10 \%$ / $- 3.5 \%$
EN 10 210-2		
Permissible Variations of Outside diameter	$\pm 1 \%$ min. $\pm 0.5 \text{ mm}$. max. $\pm 10 \text{ mm}$	
Permissible Variations of Wall thickness	$- 10 \%$. + it is limited by weight tolerance	
It is possible max. tolerance $- 12.5 \%$ for 25 % of the diameter.		
Permissible Variations of Weight for individual tube	$\pm 6 \%$ (it is possible max. tolerance $+ 8 \%$)	
EN 10 216-1 and 4		
Outside dia- meter (mm)	Permissible Variations of Outside diameter	Permissible Variations of Wall thickness according to ratio t/D
		$t/D \leq 0.025$ $0.025 < t/D \leq 0.1$
$D \leq 219.1$		$\pm 12.5 \%$ or $\pm 0.4 \text{ mm}$ (higher value is always valid)

D > 219.1	± 1 % or ± 0.5 mm (higher value is always valid)	± 20 % ± 12.5 %	± 15 % ± 10 %*
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* For D ≥ 355.6 mm it is possible to increase the local tolerance by about 5 %

EN 10 216-2 and 3

Outside dia- meter (mm)	Permissible Variations of Outside diameter	Permissible Variations of Wall thickness according to ratio t/D	
		t/D ≤ 0.025 t/D ≤ 0.05	0.025 < t/D ≤ 0.1 t/D > 0.1
D ≤ 219.1	± 1 % or ± 0.5 mm (higher value is always valid)	± 12.5 % or ± 0.4 mm (higher value is always valid)	
D > 219.1		± 20 % ± 12.5 %	± 15 % ± 10 %*

There are also tolerances for combination of tolerances for inner diameter and wall thickness, outside diameter and minimum wall thickness, inner diameter and minimum wall thickness.

EN 10297-1

Outside dia- meter (mm)	Permissible Variations of Outside diameter	Permissible Variations of Wall thickness according to ratio t/D	
		t/D ≤ 0.025	0.025 < t/D ≤ 0.05 t/D > 0.05
D ≤ 219.1	± 1 % or ± 0.5 mm (higher value is always valid)	± 12.5 % or ± 0.4 mm (higher value is always valid)	
D > 2,191		± 20 %	± 15 %
		± 12.5 %	
Wall thickness (mm)	Permissible Variations of Wall thickness		
	with higher accuracy	with common accuracy	
up to 15 including	± 12.5 %	+ 12.5 % / - 15.0 %	
from 15 to 30	+ 10.0 % /	± 12.5 %	
	- 12.5 %		
over 30	± 10.0 %	+ 10.0 % / - 12.5 %	
up to 15 including	+ 12.5 % / - 15.0 %		
from 15 to 30	± 12.5 %		
over 30	+ 10.0 % / - 12.5 %		
Legend: D = outside diameter, t = wall thickness			