

# Part II

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## *Industry Background*

To set the stage for the market analysis of the requirement for blanks, pressings and semi-finished components (BPSFC) in selected countries, background information on the global stainless steel industry is provided. This analysis indicated that the regions and countries with the highest intensity of stainless steel processing and fabricating activity theoretically hold the most potential as target markets for launching a marketing campaign for the supply (export) of BPSFC.

- The stainless steel flat product consumption is growing strongly in Asia. Therefore, Asia is attractive for further investments into production and fabrication of stainless steel.
- Another important aspect is that in the future investments in Asia (at stainless steel mills and fabricators) also indicate a stronger competition for South African producers, fabricators and BPSFC producers. All countries are in a global investment competition.

Please note, that stainless data this section deals with stainless steel flat products including cold and hot rolled flat products (coils for direct use, quarto plate and de-coiled sheet) but excluding coils for re-rolling.

# 1. Supply and Demand Analysis

In this analysis for the main markets, the following definitions are used:

- a) Demand (apparent consumption) is defined as:

**Supply (Production) plus Imports minus Exports**

- b) Net import surplus is identified in regions / countries where the import is higher than exports:

**Net Import Surplus: Imports > Exports**

China is a typical example of a country with a net import surplus: consumption is substantially higher than production. This has led to a spate of new investments (often by foreign entities) in old and new capacities to feed the domestic demand with locally produced material.

- c) **Net export surplus** on the other hand shows that a region / country produces more than it can consume.

**Net Export Surplus: Exports > Imports**

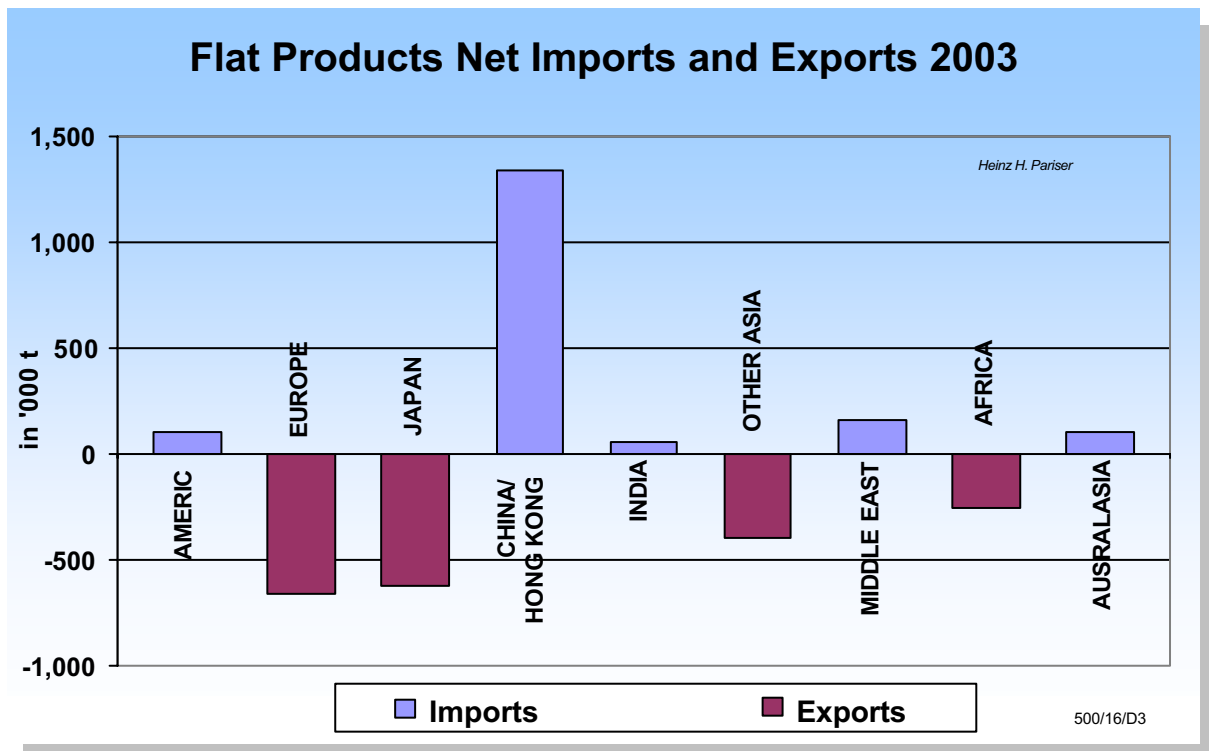
On the other end of the scale, South Africa can be defined as a country with a net export surplus. The country's only stainless steel producer, Columbus Stainless, puts out more than the local market can absorb. Columbus is forced to export most of its products to overseas destinations.

## 1.1 Supply and Demand Balance

The table on the next page presents a synopsis of supply, demand and net imports / exports. The “Stainless Steel ratio” is defined here as the ratio of local stainless steel supply divided by local demand. This ratio explains a self-sufficiency of countries: the ability of a country to cover local demand with local production.

The deviation between demand and supply was less than 0.5% in 2003. Figures for demand and supply cannot be identical as there are some phases of significant stocking or de-stocking.

In 2003, the major net importer was **China** with 1.3 Mill t. Please note, that China also imported 1 million t of coils for re-rolling which were not part of the above calculation. These coils are transformed into cold rolled material, thus volumes are reflected in domestic flat product production.



## Market Statistics for SS Flat Products (excluding hot rolled coils for re-rolling)

Country/Region	2002						2003					
	SS Flat Products in '000 t											
	Supply	Demand	Net Import	Net Export	SS Ratio (%)	Supply	Demand	Net Import	Net Export	SS Ratio (%)		
<b>America</b>	1,534	1,668	134		91.9	1,612	1,721	109		93.7		
USA	279	347	68		80.3	285	380	95		75.1		
Other NAFTA	280	245		35	114.4	398	303		95	131.5		
<b>Total America</b>	<b>2,093</b>	<b>2,260</b>	<b>167</b>		<b>92.6</b>	<b>2,295</b>	<b>2,403</b>	<b>108</b>		<b>95.5</b>		
<b>Europe</b>	694	353		341	196.7	689	383		306	180.1		
France	959	905		54	106.0	988	932		57	106.1		
Germany	765	1,038	273		73.7	777	1,057	280		73.5		
Italy	291	294	3		98.8	280	294	14		95.1		
United Kingdom	759	485		274	156.6	779	538		241	144.8		
Spain	1,482	647		835	229.1	1,568	704		864	222.8		
Other EU	0	257	257		0.0	0	288	288		0.0		
Other W. Europe	139	327	188		42.5	154	379	225		40.6		
<b>Total Europe</b>	<b>5,089</b>	<b>4,306</b>		<b>783</b>	<b>118.2</b>	<b>5,235</b>	<b>4,574</b>		<b>661</b>	<b>114.4</b>		
<b>Asia</b>	2,502	1,812		691	138.1	2,574	1,945		629	132.3		
Japan	1,269	2,595	1,326		48.9	1,479	2,819	1,340		52.5		
China/Hong Kong	829	853	24		97.2	865	923	58		93.8		
India	1,018	555		463	183.6	1,124	654		470	171.8		
Taiwan	150	127		23	118.3	170	129		41	131.8		
Thailand	1,181	958		223	123.3	1,286	1,083		203	118.8		
South Korea	20	350	330		5.7	18	413	395		4.4		
Other Asia	<b>6,969</b>	<b>7,249</b>	<b>280</b>		<b>96.1</b>	<b>7,516</b>	<b>7,966</b>	<b>450</b>		<b>94.4</b>		
<b>Total Asia</b>	<b>0</b>	<b>127</b>	<b>127</b>		<b>0.0</b>	<b>0</b>	<b>161</b>	<b>161</b>		<b>0.0</b>		
<b>Middle East</b>	411	241		170	170.4	475	214		261	222.0		
<b>Africa</b>	0	93	93		0.0	0	104	104		0.0		
<b>Australasia</b>	<b>14,562</b>	<b>14,277</b>		<b>285</b>	<b>102.0</b>	<b>15,521</b>	<b>15,422</b>		<b>99</b>	<b>100.6</b>		
<b>Total Flat</b>												

China is followed by **Other Asia** (especially countries with little or no production activities, such as Vietnam, Philippines, Malaysia, Singapore and Indonesia) with 0.4 million t and Other Western Europe with 0.3 million t. In Other Western Europe, the major markets are Turkey and Switzerland.

As a region, the **European Union** is a net exporter. Within the region there are also net importing countries such as Denmark, Netherlands, Portugal (non-producers) and Italy.

**America** is more or less balanced (net import surplus 2003: approx. 100 kt). The NAFTA countries are net importers of stainless steel flat products, Brazil is a net exporter of stainless steel flat products.

America, Asia and Europe can handle their domestic demand with regional production. The self-sufficiency rates are here between 95% and 115%. The majority of imports and exports are intra-trade based. It seems unnecessary to export to far away markets if the output can easily be absorbed regionally.

The lowest self-sufficiency rates are recorded in China, Other NAFTA (Mexico and Canada), Middle East and Australasia. It also explains the vast interest that China has generated in the world of stainless steel.

## 1.2 Market Attractiveness

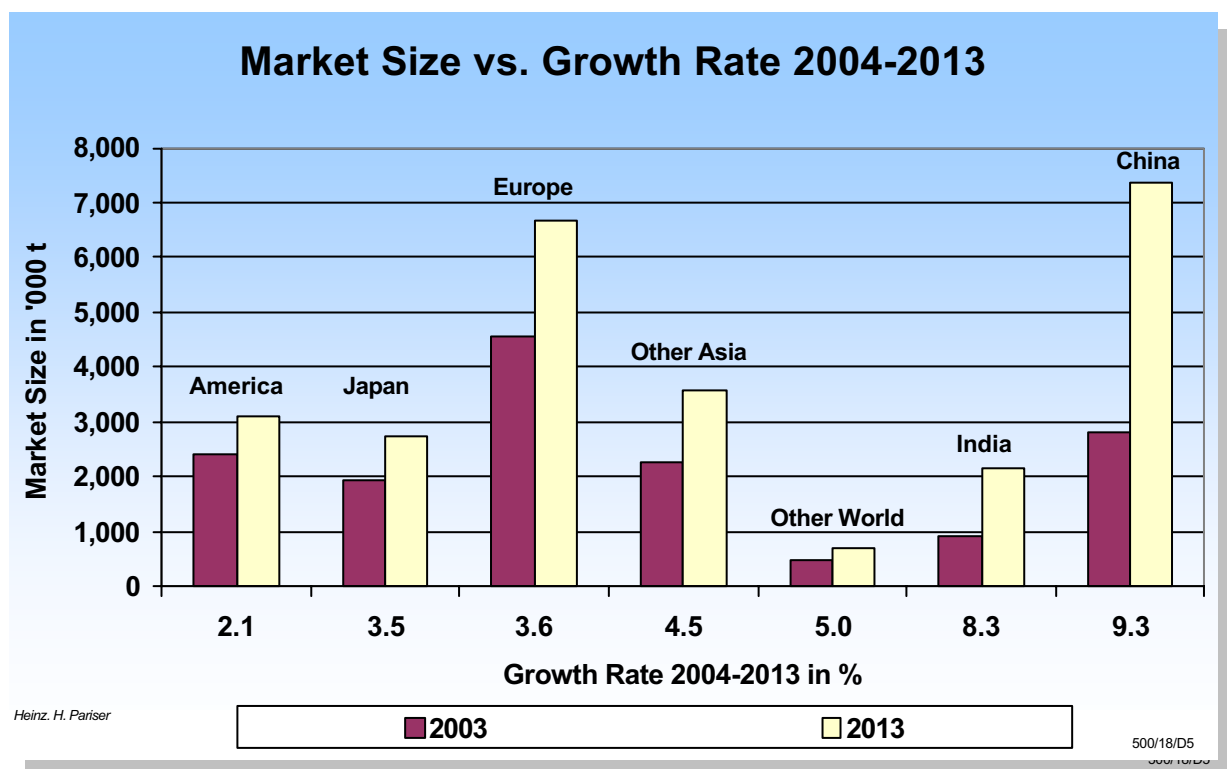
Market Attractiveness is shaped by:

- the interest that investors show in a country / region or
- the interest of stainless steel producers to export to a certain country or region.

**Attractive regions / countries** generally show sustained growth with positive future prospects. Other indicators are large consumption volumes and a net import surplus – indicating low competition between a supplier and local integrated manufacturers or re-rollers. Net export markets struggle to absorb local production, in turn forcing producers to export.

The next graph shows market size versus growth rate for the period 2003 to 2013. The dark bar represent market size in 2003, the yellow bar estimated future market size in 2013. It also gives a ranking of sorts showing growth potentials (from left to right). The most attractive region in terms of future potential is China (growth: 9.3% p.a.). America shows little growth (only 2.1% p.a.) but has a large market. Europe and Other Asia are in the middle. Europe is an interesting market because of its size, Other Asia because of its growth rate.

Currently, China is the most promising market. During the next years, new capacities will start up and will in turn lead to a stronger competition and maybe the ability to cover local demand completely by local supply in the future.



This table shows the regional market attractiveness:

## Regional Market Attractiveness 2003

500/16/T10

Region	Market Size		Growth 2004-13 in % p.a.	Net Importer 2003	Attractiveness 2003
	2003	2013			
	in '000 t				
<b>HIGH ATTRACTIVENESS</b>					
China	2,819	7,371	9.3	yes	very high
India	923	2,149	8.3	yes	high
Other Asia	2,279	3,575	4.5	no	high
<b>MEDIUM ATTRACTIVENESS</b>					
Europe	4,574	6,673	3.6	no	medium
Japan	1,945	2,740	3.5	no	medium
<b>LOW ATTRACTIVENESS</b>					
America	2,403	3,110	2.1	yes	low
Middle East	162	257	6.4	yes	low
Australasia	104	136	3.1	yes	low
Africa	214	322	4.9	no	low

**Highly attractive markets:** India and Other Asia. Together, both regions are expected to consume more than 5.5 million t in 2013. However, stainless steel prices are low in India, usage of specific grades such as 200 Series and 2<sup>nd</sup> grade material importance are also factors for people interested in the Indian market.

**Markets of medium attractiveness:** Europe and Japan. Both markets are highly industrialised but they are saturated regions. The growth rates in both regions are below world average, they are net exporters and the manufacturing side of the industry has been through a process of consolidation.

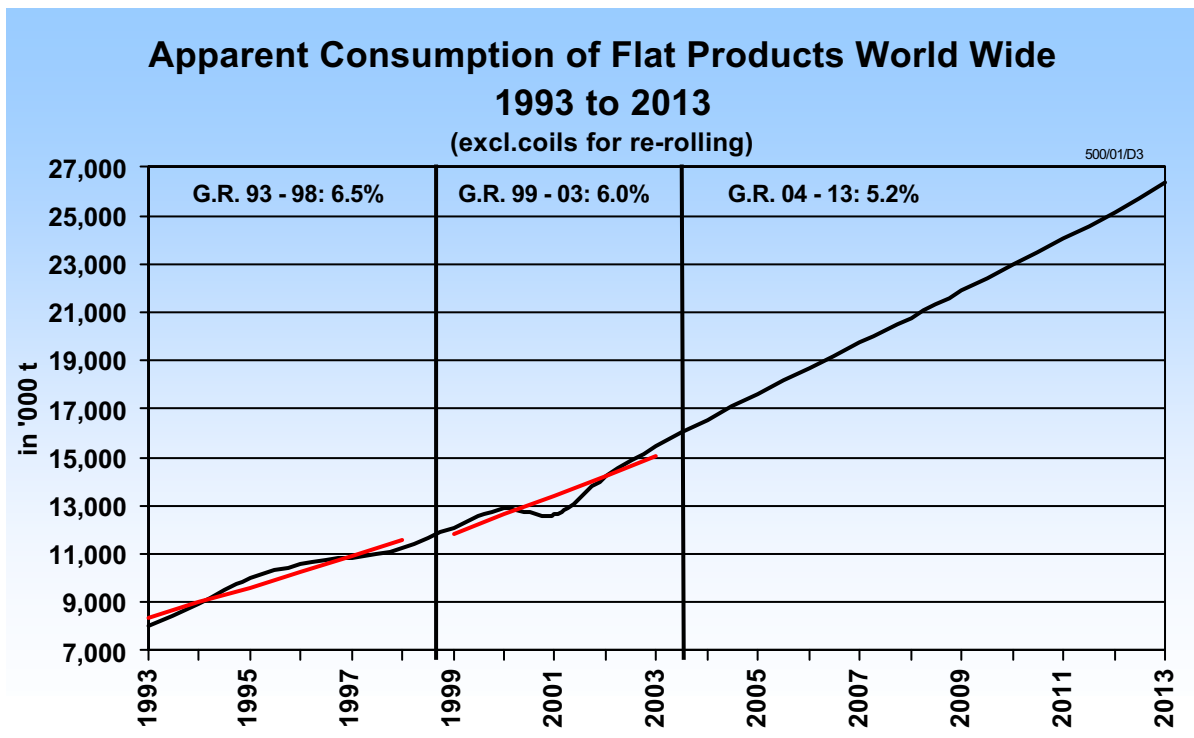
**Markets of low attractiveness:** America and Other World. America is dominated by the US market which represents a saturated market with little growth in stainless steel. Other Worlds' markets are rapidly growing but will remain relatively small even in 2013.

## 2. Apparent Consumption Forecast 2003 – 2013

In this review on stainless steel flat products, a demand forecast for the next decade in major global regions is discussed.

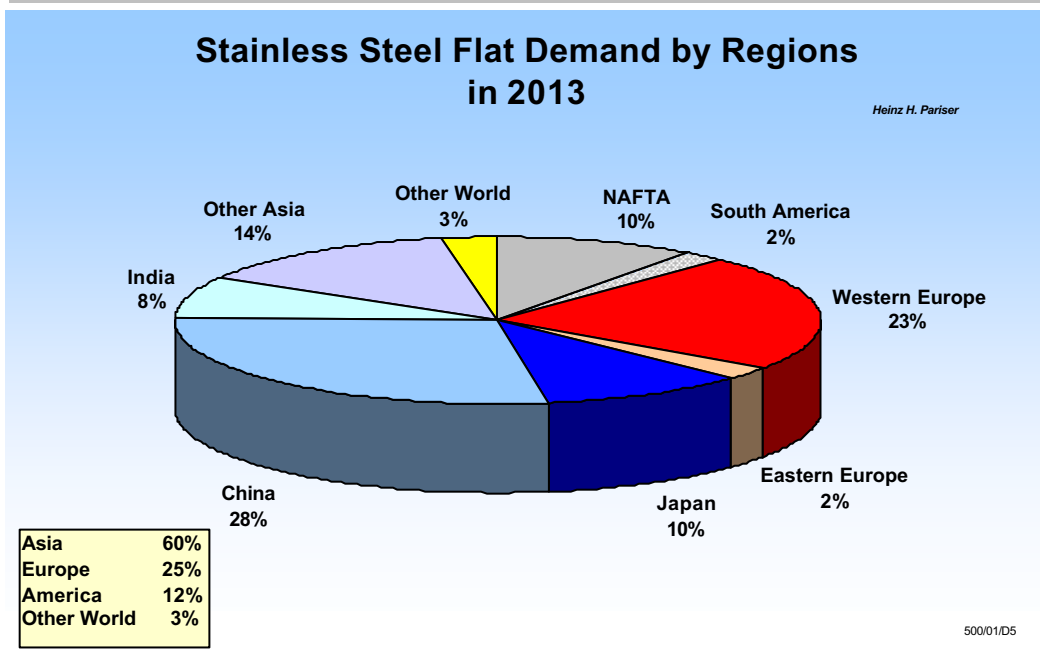
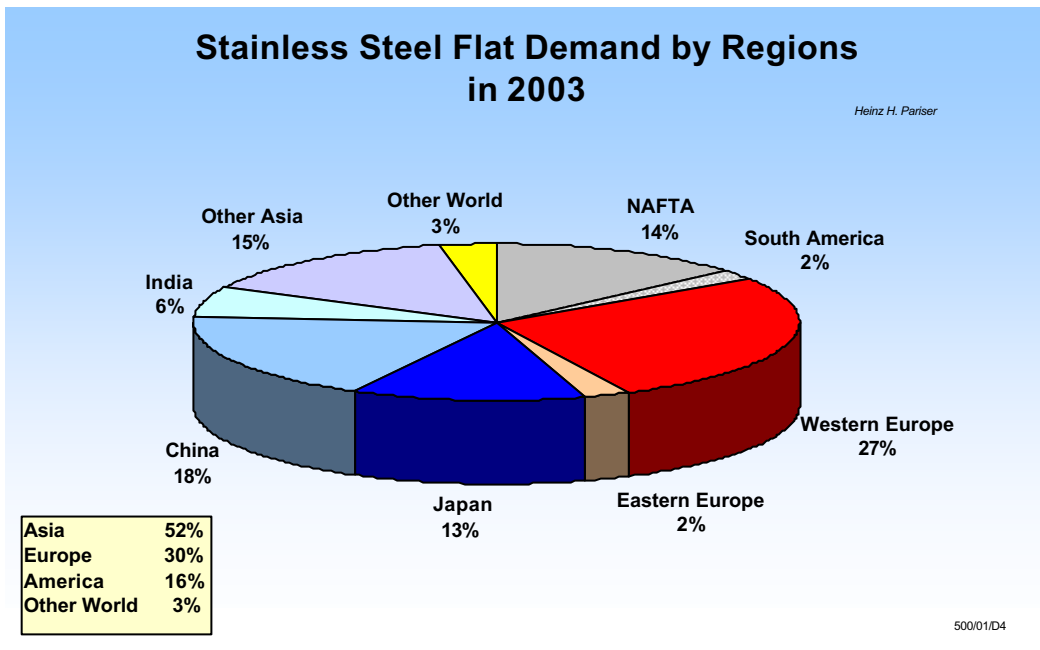
The outlook for global apparent consumption of all flat rolled products is well portrayed in the following diagrams. Steady growth of 5.2% can be expected in the next decade that is slightly lower than the previous two time series. The strongest growth (6.5%) was experienced during the 1990's, dropping slightly during the troublesome times of the period 1999 and 2003.

It is expected that as much as 25 Mill t of flat products will be consumed worldwide, driven by the insatiable demand of the Chinese industry.



The following two diagrams indicate the apparent consumption / demand by regions, firstly in 2003 and then 2013. It is interesting to note the large deviation in the Chinese share of this demand analysis. Very few of the other players (mainly Asian countries) increase market share during this period. The mature markets such as the United States, Western Europe and Japan maintain relatively stable demand levels.

Looking at the cumulated figures for regional demand, Asia is no doubt the driving force of this estimated increase in global consumption as illustrated in the line graph.



## Apparent Consumption

Total Flat Products (excl. Coils for Re-Rolling)

Country/Region	2004	2006	2008	2010	2011	2012	2013	G. R. in % p.a. 2004 - 13
in '000 t								
<b>AMERICA</b>								
<b>NAFTA</b>								
USA	1,865.6	1,917.9	1,970.3	2,022.6	2,048.8	2,074.9	2,101.1	1.3
Canada	231.6	248.1	264.5	281.0	289.2	297.4	305.6	3.1
Mexico	167.7	187.8	207.9	228.0	238.1	248.1	258.2	4.9
<b>Subtotal NAFTA</b>	<b>2,264.9</b>	<b>2,353.8</b>	<b>2,442.7</b>	<b>2,531.6</b>	<b>2,576.0</b>	<b>2,620.5</b>	<b>2,664.9</b>	<b>1.8</b>
<b>SOUTH AMERICA</b>								
Colombia	12.4	13.0	13.5	14.1	14.4	14.7	15.0	2.1
Venezuela	6.0	6.1	6.2	6.3	6.3	6.4	6.4	0.8
Brazil	254.1	280.3	306.5	332.7	345.7	358.8	371.9	4.3
Chile	9.6	10.1	10.6	11.0	11.3	11.5	11.8	2.3
Argentina	13.3	13.8	14.4	15.0	15.3	15.6	15.9	2.0
Others	14.5	16.6	18.7	20.8	21.8	22.9	23.9	5.7
<b>Subtotal South America</b>	<b>309.9</b>	<b>339.8</b>	<b>369.9</b>	<b>399.9</b>	<b>414.9</b>	<b>429.9</b>	<b>444.9</b>	<b>4.1</b>
<b>Subtotal America</b>	<b>2,574.8</b>	<b>2,693.6</b>	<b>2,812.5</b>	<b>2,931.4</b>	<b>2,990.9</b>	<b>3,050.3</b>	<b>3,109.8</b>	<b>2.1</b>
<b>EUROPE</b>								
<b>W. EUROPE</b>								
<b>EU</b>								
France	428.4	444.2	460.0	475.9	483.8	491.7	499.6	1.7
Belgium/Luxemburg	124.7	133.1	141.5	149.9	154.1	158.2	162.4	3.0
Netherlands	89.3	88.0	86.8	85.6	84.9	84.3	83.7	-0.7
Germany	993.7	1,036.9	1,080.2	1,123.4	1,145.0	1,166.6	1,188.2	2.0
Italy	1,137.6	1,238.1	1,338.6	1,439.1	1,489.3	1,539.6	1,589.8	3.8
United Kingdom	291.1	311.4	332.1	353.2	363.8	374.6	385.5	3.2
Ireland	13.6	13.9	14.2	14.5	14.7	14.8	15.0	1.1
Denmark	83.5	90.5	97.4	104.4	107.8	111.3	114.8	3.6
Greece	30.7	33.3	35.9	38.6	39.9	41.2	42.5	3.7
Portugal	50.4	54.4	58.3	62.3	64.2	66.2	68.2	3.4
Spain	558.8	640.1	721.5	802.8	843.5	884.1	924.8	5.7
Sweden	224.0	250.7	277.4	304.1	317.5	330.8	344.2	4.9
Finland	75.8	76.9	78.1	79.2	79.7	80.3	80.9	0.7
Austria	82.5	90.2	98.0	105.7	109.6	113.4	117.3	4.0
<b>Subtotal EU</b>	<b>4,184.0</b>	<b>4,501.8</b>	<b>4,819.9</b>	<b>5,138.4</b>	<b>5,297.7</b>	<b>5,457.2</b>	<b>5,616.8</b>	<b>3.3</b>
<b>OTHER W. EUROPE</b>								
Norway	28.1	28.7	29.3	29.9	30.1	30.4	30.7	1.0
Switzerland	114.7	123.1	131.4	139.8	144.0	148.1	152.3	3.2
Malta	3.8	4.4	5.0	5.7	6.0	6.3	6.6	6.2
Turkey	142.1	157.5	172.9	188.2	195.9	203.6	211.3	4.5
Others	2.5	2.9	3.2	3.4	3.5	3.7	3.9	3.5
<b>Subtotal Other W. Europe</b>	<b>291.3</b>	<b>316.6</b>	<b>341.8</b>	<b>366.9</b>	<b>379.5</b>	<b>392.1</b>	<b>404.8</b>	<b>3.7</b>
<b>Subtotal W. Europe</b>	<b>4,475.4</b>	<b>4,818.4</b>	<b>5,161.7</b>	<b>5,505.2</b>	<b>5,677.3</b>	<b>5,849.4</b>	<b>6,021.6</b>	<b>3.3</b>

**Apparent Consumption**  
Total Flat Products (excl. Coils for Re-Rolling)

Country/Region	2004	2006	2008	2010	2011	2012	2013	G. R. in % p.a.
	in '000 t							2004 - 13
<b>E. EUROPE</b>								
Baltic Countries	11.4	13.6	15.9	18.4	19.6	20.9	22.3	7.7
Poland	80.3	92.1	104.0	115.8	121.8	127.7	133.6	5.8
Czech. Republic	58.4	68.5	78.6	88.7	93.7	98.8	103.8	6.5
Slovakia	12.1	14.2	16.3	18.4	19.5	20.6	21.6	6.6
Hungary	35.0	40.4	45.9	51.3	54.0	56.7	59.4	6.0
Romania	23.7	27.9	32.0	36.1	38.1	40.2	42.3	6.6
Bulgaria	5.5	6.4	7.4	8.3	8.8	9.3	9.7	6.6
Ukraine	6.3	7.8	9.3	10.7	11.5	12.2	12.9	8.2
Russia	97.9	110.1	122.3	134.5	140.6	146.7	152.8	5.0
Slovenia	36.9	41.2	45.5	49.8	51.9	54.1	56.2	4.8
Croatia	10.6	12.6	14.7	16.7	17.8	18.8	19.8	7.2
Others	9.9	11.3	12.7	14.5	15.2	16.2	17.0	6.2
<b>Subtotal E. Europe</b>	<b>388.0</b>	<b>446.2</b>	<b>504.5</b>	<b>563.2</b>	<b>592.4</b>	<b>622.1</b>	<b>651.4</b>	<b>5.9</b>
<b>Subtotal Europe</b>	<b>4,863.4</b>	<b>5,264.5</b>	<b>5,666.2</b>	<b>6,068.4</b>	<b>6,269.7</b>	<b>6,471.5</b>	<b>6,673.1</b>	<b>3.6</b>
<b>ASIA</b>								
Japan	2,005.9	2,148.0	2,301.4	2,466.9	2,554.6	2,645.6	2,740.2	3.5
China / Hong Kong	3,235.5	4,115.3	4,986.1	5,890.6	6,348.2	6,840.6	7,370.7	9.3
India	1,035.3	1,281.3	1,528.1	1,775.8	1,899.9	2,024.3	2,148.9	8.3
<b>OTHER ASIA</b>								
Taiwan	713.5	759.8	806.1	852.4	875.5	898.7	921.8	2.9
Bangladesh	4.5	5.4	6.4	7.3	7.8	8.2	8.7	7.5
Thailand	153.9	169.6	185.4	201.2	209.1	217.0	224.9	4.3
Vietnam	80.0	93.4	106.8	120.2	126.9	133.7	140.4	6.4
Indonesia	87.1	96.4	105.8	115.2	119.9	124.6	129.3	4.5
Malaysia	83.3	93.4	103.5	113.5	118.6	123.6	128.7	4.9
Singapore	125.5	154.1	182.8	211.5	225.8	240.1	254.5	8.1
Philippines	33.2	35.6	37.9	40.2	41.4	42.5	43.7	3.1
South Korea	1,105.6	1,240.3	1,375.0	1,509.7	1,577.0	1,644.4	1,711.7	5.0
Others	6.7	7.7	8.6	9.5	9.9	10.4	10.8	5.5
<b>Subtotal Other Asia</b>	<b>2,393.1</b>	<b>2,655.7</b>	<b>2,918.2</b>	<b>3,180.7</b>	<b>3,312.0</b>	<b>3,443.2</b>	<b>3,574.5</b>	<b>4.5</b>
<b>MIDDLE EAST</b>								
Syria	11.7	13.8	15.9	18.0	19.1	20.1	21.2	6.7
Iran	34.0	39.2	44.4	49.6	52.2	54.8	57.4	6.0
Israel	14.5	15.4	16.3	17.3	17.8	18.2	18.7	2.9
Saudi Arabia	13.1	15.0	16.9	18.7	19.7	20.6	21.5	5.6
U.A.E.	37.9	46.4	55.0	63.6	67.9	72.2	76.5	8.0
Pakistan	23.6	26.7	29.8	32.9	34.4	36.0	37.6	5.3
Others	12.0	14.4	16.9	19.5	21.0	22.4	24.0	7.9
<b>Subtotal Middle East</b>	<b>146.9</b>	<b>170.9</b>	<b>195.2</b>	<b>219.6</b>	<b>231.9</b>	<b>244.3</b>	<b>256.8</b>	<b>6.4</b>
<b>AFRICA</b>								
Morocco	6.9	8.1	9.4	10.6	11.2	11.9	12.5	6.8
Algeria	6.0	7.2	8.3	9.5	10.1	10.6	11.2	7.1
Tunisia	5.3	6.3	7.3	8.3	8.8	9.3	9.8	7.1
Egypt	21.8	24.2	26.6	29.0	30.2	31.4	32.7	4.6
South Africa	164.6	183.3	202.1	220.8	230.2	239.5	248.9	4.7
Others	4.8	5.3	5.7	6.1	6.3	6.5	6.7	3.8
<b>Subtotal Africa</b>	<b>209.3</b>	<b>234.5</b>	<b>259.4</b>	<b>284.3</b>	<b>296.8</b>	<b>309.3</b>	<b>321.8</b>	<b>4.9</b>
<b>AUSTRALASIA</b>								
Australia	86.8	92.6	98.5	104.3	107.3	110.2	113.1	3.0
New Zealand	16.3	17.7	19.2	20.7	21.4	22.2	22.9	3.9
Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Subtotal Australasia</b>	<b>103.0</b>	<b>110.4</b>	<b>117.7</b>	<b>125.0</b>	<b>128.7</b>	<b>132.4</b>	<b>136.0</b>	<b>3.1</b>
Not Identified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>GRAND TOTAL</b>	<b>16,567.2</b>	<b>18,674.3</b>	<b>20,784.7</b>	<b>22,942.8</b>	<b>24,032.6</b>	<b>25,161.6</b>	<b>26,331.8</b>	<b>5.2</b>

## 3. Stainless Steel End Use Forecast

This section integrates several assumptions and estimates about future development in several end use sectors. The total end use in all segments is equal to the total stainless steel flat consumption forecast above. However, the segments may eventually develop in a different way than consumption.

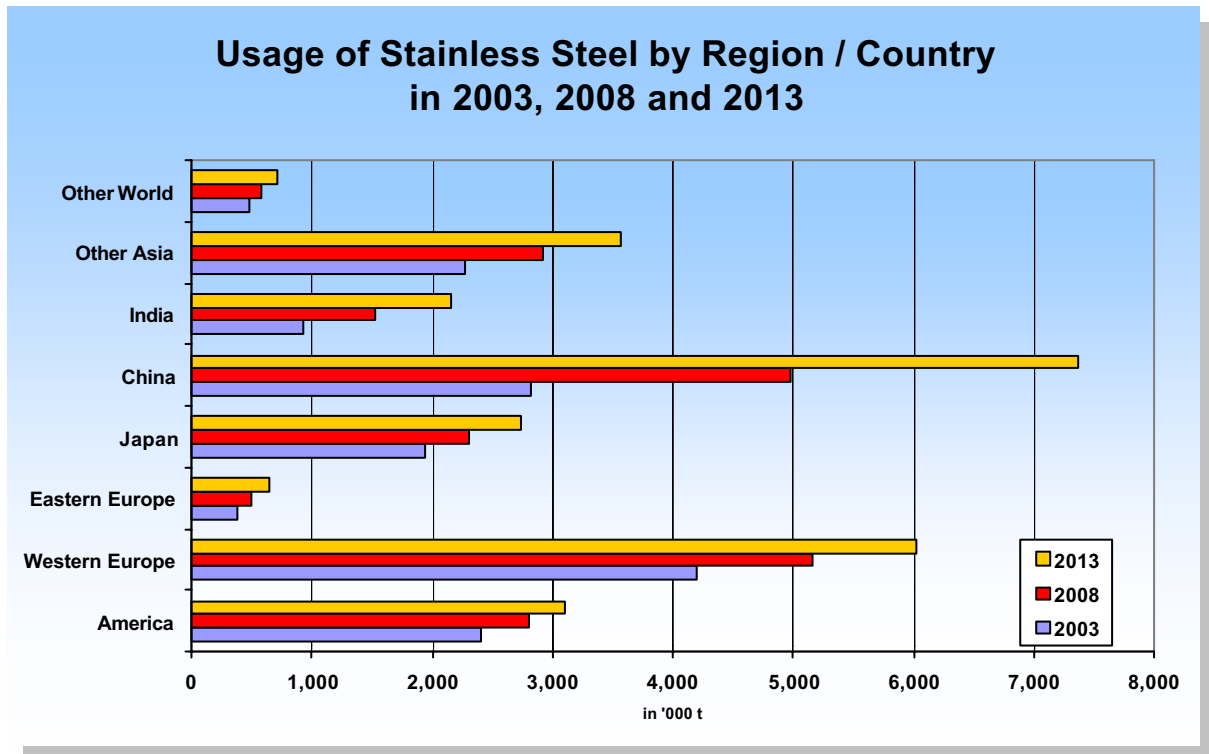
The table below illustrates the end use by segments from 1993 to 2013.

**Stainless Steel End Use Structure 1993 to 2013**

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Region / Sector	Actual				Growth Rate 93 - 03 in % p.a.	Forecast			Growth Rate 04 - 13 in % p.a.
	1993	2000	2002	2003 e)		2004	2008	2013	
	in '000 t					in '000 t			
<b>AMERICA</b>									
Transport	357	647	572	619	4.8	652	799	845	2.9
Electrical Machinery	133	169	152	160	1.6	163	176	188	1.6
Engineering	323	489	446	499	3.5	516	551	604	1.8
Building & Construction	194	347	304	321	3.7	333	386	464	3.8
Tubular Products	160	243	220	232	3.1	239	270	316	3.1
Metal Goods	282	283	251	255	-2.1	254	254	253	-0.1
Other	311	347	322	318	0.1	417	377	440	0.7
<b>Total</b>	<b>1,760</b>	<b>2,525</b>	<b>2,266</b>	<b>2,403</b>	<b>2.4</b>	<b>2,575</b>	<b>2,813</b>	<b>3,110</b>	<b>2.1</b>
<b>EUROPE</b>									
Transport	190	597	626	708	13.2	743	896	1,068	4.0
Electrical Machinery	194	280	276	339	4.4	354	421	525	4.4
Engineering	687	1,023	999	1,088	4.0	1,121	1,267	1,477	3.1
Building & Construction	236	578	567	568	9.1	619	787	1,065	6.1
Tubular Products	443	836	826	879	6.6	935	1,055	1,260	3.4
Metal Goods	374	579	526	537	3.1	538	588	682	2.8
Other	324	534	491	455	3.0	553	652	596	1.1
<b>Total</b>	<b>2,447</b>	<b>4,427</b>	<b>4,310</b>	<b>4,574</b>	<b>5.9</b>	<b>4,863</b>	<b>5,666</b>	<b>6,673</b>	<b>3.6</b>
<b>ASIA</b>									
Transport	346	634	766	898	9.0	988	1,375	2,062	8.5
Electrical Machinery	215	400	526	600	9.9	670	911	1,340	8.1
Engineering	590	878	1,189	1,372	7.7	1,455	1,857	2,564	6.5
Building & Construction	618	855	1,144	1,296	6.6	1,388	1,821	2,628	7.4
Tubular Products	439	700	841	923	6.9	994	1,332	1,976	7.9
Metal Goods	810	1,418	2,014	2,185	9.5	2,454	3,111	4,079	5.9
Other	558	663	737	691	1.2	721	1,328	1,185	4.7
<b>Total</b>	<b>3,578</b>	<b>5,548</b>	<b>7,217</b>	<b>7,966</b>	<b>7.3</b>	<b>8,670</b>	<b>11,734</b>	<b>15,834</b>	<b>6.8</b>
<b>OTHER WORLD</b>									
Transport	34	68	89	107	11.6	113	146	202	6.8
Electrical Machinery	14	19	21	25	5.3	26	32	42	5.3
Engineering	57	79	96	113	6.5	115	134	158	3.6
Building & Construction	29	47	58	69	8.4	72	94	120	5.9
Tubular Products	22	29	32	38	4.7	36	44	51	4.1
Metal Goods	45	62	75	89	6.5	91	109	129	4.1
Other	34	36	37	41	1.3	5	12	13	3.3
<b>Total</b>	<b>235</b>	<b>341</b>	<b>409</b>	<b>480</b>	<b>6.8</b>	<b>459</b>	<b>572</b>	<b>715</b>	<b>5.0</b>
<b>GRAND TOTAL</b>									
Transport	927	1,947	2,053	2,331	8.8	2,496	3,216	4,177	5.8
Electrical Machinery	556	868	975	1,124	6.4	1,213	1,540	2,095	6.3
Engineering	1,657	2,469	2,729	3,071	5.4	3,207	3,810	4,803	4.6
Building & Construction	1,078	1,827	2,073	2,254	6.8	2,412	3,088	4,277	6.5
Tubular Products	1,064	1,808	1,919	2,072	6.2	2,205	2,701	3,603	5.6
Metal Goods	1,511	2,342	2,865	3,066	6.4	3,338	4,061	5,143	5.0
Other	1,227	1,580	1,587	1,505	1.5	1,696	2,368	2,233	2.8
<b>Total</b>	<b>8,020</b>	<b>12,840</b>	<b>14,201</b>	<b>15,423</b>	<b>5.9</b>	<b>16,567</b>	<b>20,785</b>	<b>26,332</b>	<b>5.2</b>

The table highlights only the four major regions America, Europe, Asia (including Japan, China and India) and Other World. Asia will remain the driving force for future consumption, the other three regions (i.e. America) are expected to display below average growth.

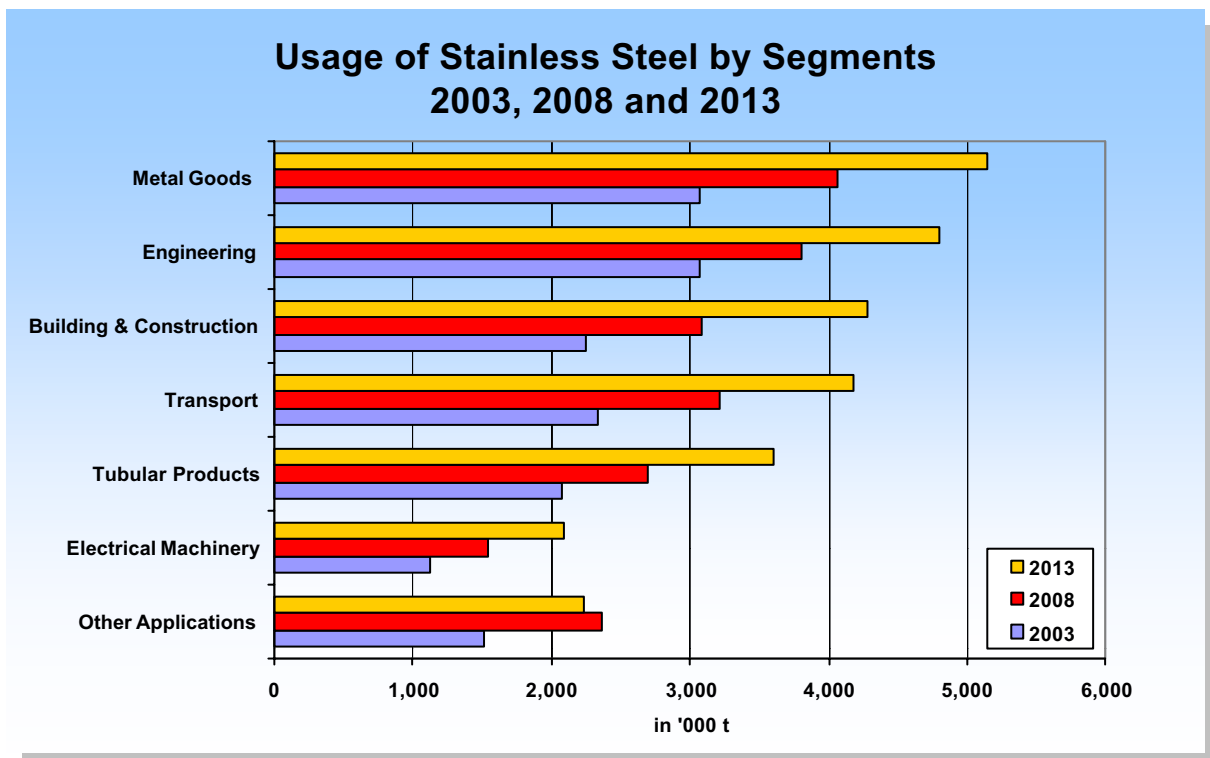


The largest consumer of stainless steel will be Asia with 15.8 million t of stainless steel flat products in 2013. China is responsible for 47% of the Asian consumption, followed by Japan with only 17% of the Asian consumption. This shows the importance of China in future stainless steel flat consumption. The Chinese consumption is assumed to be bigger than total European (ranked secondly) consumption in 2013.

In comparison to 2003, stainless steel flat end use will be as follows in 2013:

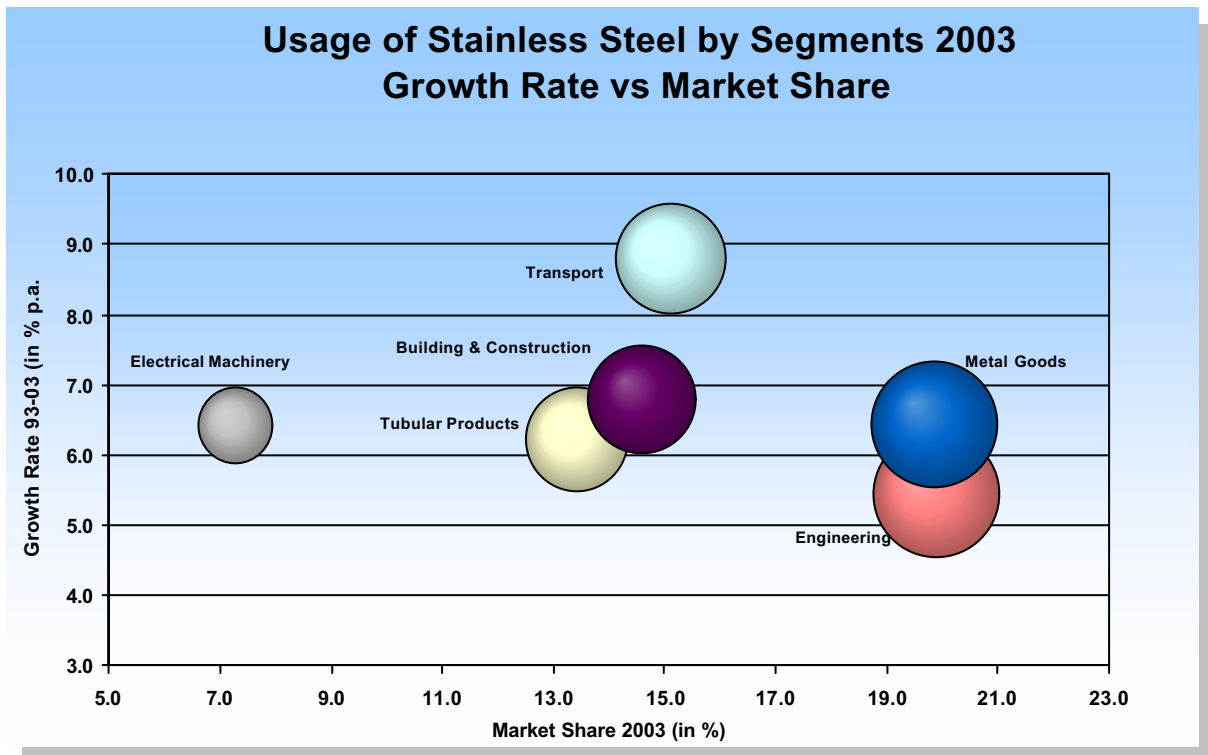
	2003	2013
<i>Transport</i>	15.1	15.9
<i>Electronics</i>	7.3	8.0
<i>Engineering</i>	19.9	18.2
<i>Building / Construction</i>	14.6	16.2
<i>Tubular Products</i>	13.4	13.7
<i>Metal Goods</i>	19.9	19.5
<i>Others</i>	9.8	8.5
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

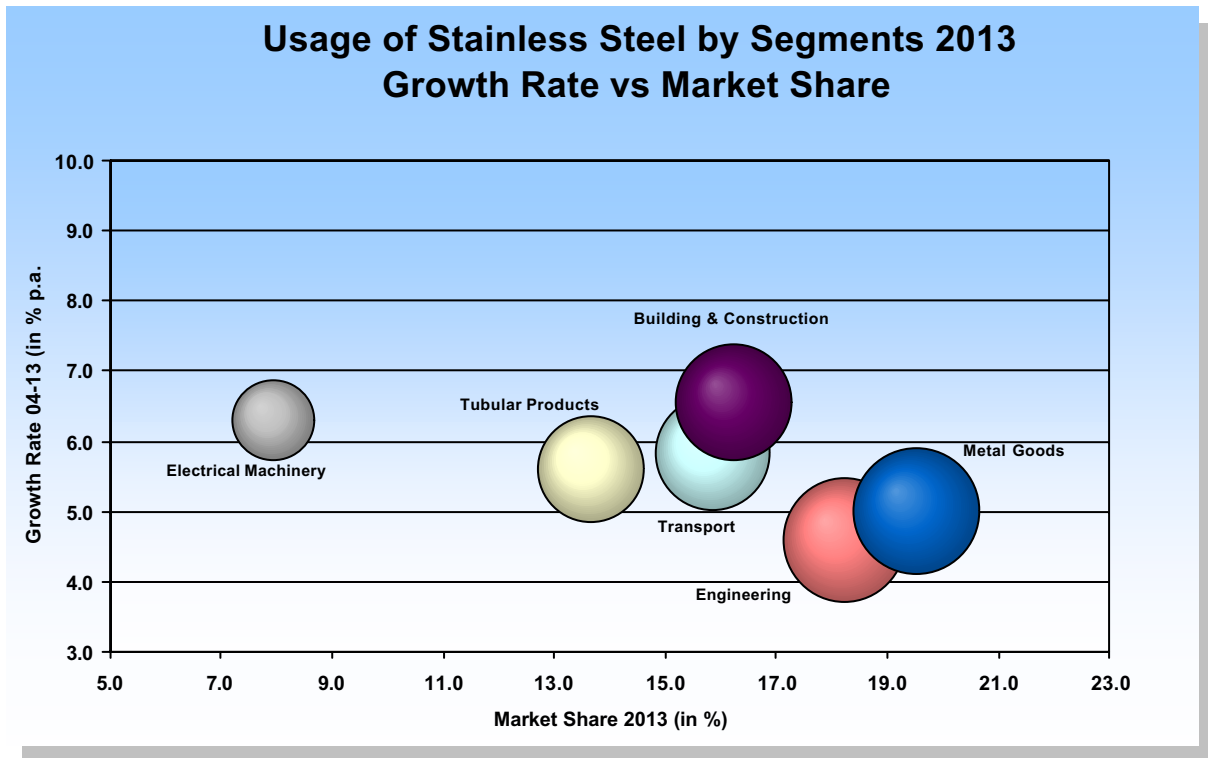
There are no big changes expected for the global end use in 2013. However, Transport, Electromechanical Applications, Tubular Goods and Building and Construction are the fastest growing segments. The largest segments, Metal Goods and Engineering, will lose market share. In total, both groups are also expected to expand from 3.1 million t in 2003 to 4.8 million t in 2013 (Engineering) and Metal Goods from 3.1 million t in 2003 to 5.1 million t in 2013. Both groups will remain important segments, ranking first and second consecutively. It is assumed that Building and Construction will surpass Transport as third ranking segment by 2013.



The following graphs show a combination of market growth (1993 to 2003 and 2004 to 2013) and market share in %. It is expected that the growth projected for the period 2004 - 2013 will not be as high as during the past decade for Transport, Metal Goods and Engineering. Transport, especially, will lose its position as the fastest growing market segment.

The average growth of 5.2% p.a. (2004 to 2013) will be driven by Transport, Electrical Machinery and Building and Construction. In contrast to the previous period (1993 to 2003) all segments will grow in a very narrow range from 4.6% p.a. (Engineering) to 6.5% p.a. (Building and Construction).





### 3.1 End Use per Capita: 2003 / 2013

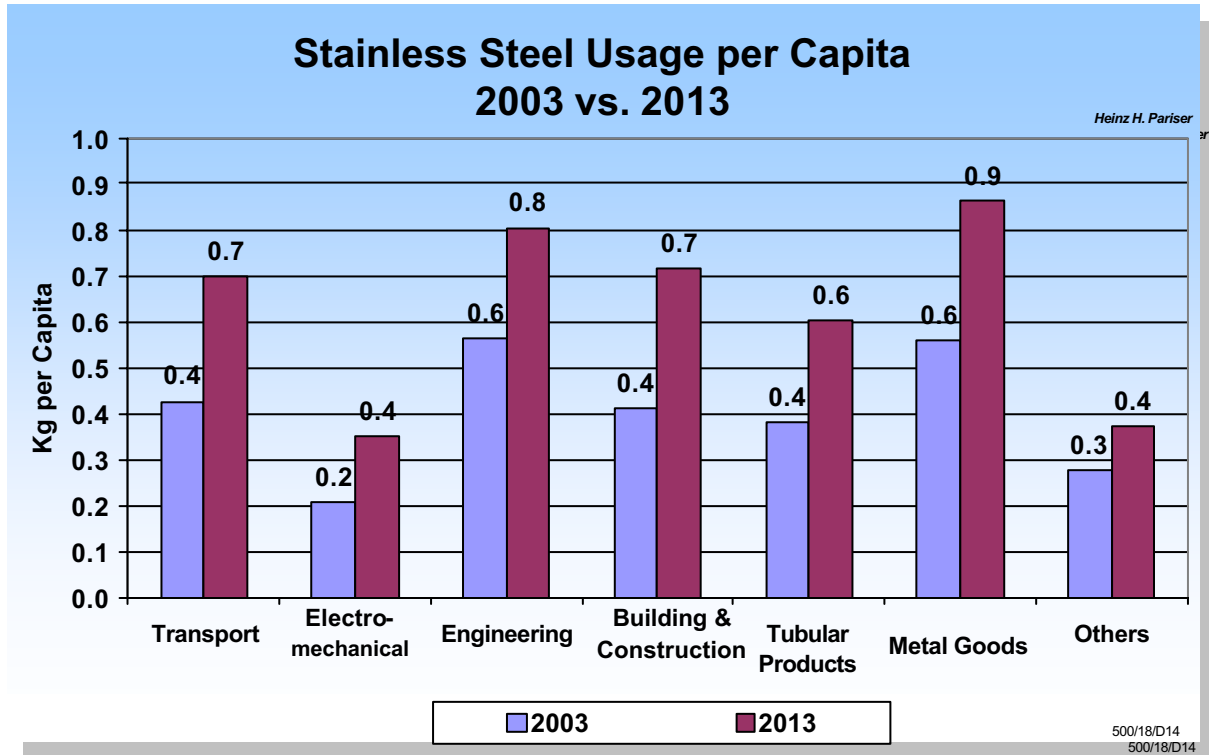
The calculation to determine end use per capita is formulated as follows:

Consumption / demand of flat rolled products divided by total population

The per capita stainless steel flat products consumption was 2.8 kg in 2003. It is expected to grow by another 1.6 kg per capita by 2013. Japan will then use 22 kg per capita and the European Union 15 kg. At the low end are South America and Other World (1.1 kg and 0.9 kg per capita).

It is estimated that all regions / countries will consume more stainless steel flat per capita in 2013 and NAFTA, EU, Japan and China than the world average. It is interesting to mention that consumption in China was still below average in 2003.

The following graph shows the usage by segments for 2003 and 2013:



### Stainless Steel Usage per Capita 2003

495/111/T3

Country/Region	Usage of Stainless Steel per Capita							Total
	Transport	Electro-mechanical	Engineering	Building & Construction	Tubular Products	Metal Goods	Others	
in kg per Capita								
<b>AMERICA</b>								
NAFTA	1.3	0.3	1.0	0.7	0.5	0.5	0.6	4.9
Other America	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.8
<b>Total America</b>	<b>0.8</b>	<b>0.2</b>	<b>0.6</b>	<b>0.4</b>	<b>0.3</b>	<b>0.3</b>	<b>0.4</b>	<b>3.0</b>
<b>EUROPE</b>								
European Union	1.6	0.8	2.4	1.3	2.0	1.1	1.1	10.3
Other Western Europe	0.3	0.3	0.9	0.4	0.8	0.6	0.2	3.6
Eastern Europe	0.2	0.1	0.3	0.1	0.1	0.2	0.1	1.1
<b>Total Europe</b>	<b>0.9</b>	<b>0.4</b>	<b>1.3</b>	<b>0.7</b>	<b>1.1</b>	<b>0.7</b>	<b>0.6</b>	<b>5.6</b>
<b>ASIA</b>								
Japan	4.0	0.9	2.6	1.8	2.0	1.6	2.3	15.3
China	0.1	0.2	0.5	0.4	0.2	0.8	0.1	2.2
India	0.0	0.1	0.1	0.1	0.1	0.5	0.0	0.9
OTHER ASIA	0.3	0.3	0.5	0.6	0.5	0.5	0.4	3.1
<b>Total Asia</b>	<b>0.3</b>	<b>0.2</b>	<b>0.4</b>	<b>0.4</b>	<b>0.3</b>	<b>0.7</b>	<b>0.2</b>	<b>2.5</b>
<b>Other World</b>								
<b>Total Others</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.7</b>
<b>Grand Total</b>	<b>0.4</b>	<b>0.2</b>	<b>0.6</b>	<b>0.4</b>	<b>0.4</b>	<b>0.6</b>	<b>0.3</b>	<b>2.8</b>

## Stainless Steel Usage per Capita 2013

500/19/T4

Country/Region	Usage of Stainless Steel per Capita							
	Transport	Electro-mechanical	Engineering	Building & Construction	Tubular Products	Metal Goods	Others	Total
	in kg per Capita							
<b>AMERICA</b>								
NAFTA	1.5	0.3	1.0	0.9	0.6	0.5	0.9	5.6
Other America	0.3	0.1	0.4	0.1	0.0	0.1	0.1	1.1
<b>Total America</b>	<b>1.0</b>	<b>0.2</b>	<b>0.7</b>	<b>0.5</b>	<b>0.4</b>	<b>0.3</b>	<b>0.5</b>	<b>3.5</b>
<b>EUROPE</b>								
European Union	2.3	1.1	3.3	2.4	2.9	1.3	1.4	14.8
Other Western Europe	0.5	0.4	0.8	0.9	0.8	0.7	0.4	4.6
Eastern Europe	0.4	0.2	0.5	0.2	0.2	0.4	0.0	1.9
<b>Total Europe</b>	<b>1.3</b>	<b>0.7</b>	<b>1.8</b>	<b>1.3</b>	<b>1.6</b>	<b>0.8</b>	<b>0.7</b>	<b>8.3</b>
<b>ASIA</b>								
Japan	7.3	1.7	2.9	2.5	2.7	1.6	3.3	22.0
China	0.3	0.3	1.1	0.9	0.6	1.8	0.4	5.4
India	0.2	0.2	0.1	0.2	0.2	0.8	0.0	1.8
OTHER ASIA	0.5	0.5	0.7	1.0	0.8	0.6	0.3	4.4
<b>Total Asia</b>	<b>0.6</b>	<b>0.4</b>	<b>0.7</b>	<b>0.7</b>	<b>0.6</b>	<b>1.2</b>	<b>0.3</b>	<b>4.5</b>
<b>Other World</b>								
<b>Total Others</b>	<b>0.3</b>	<b>0.1</b>	<b>0.2</b>	<b>0.2</b>	<b>0.1</b>	<b>0.2</b>	<b>0.0</b>	<b>0.9</b>
<b>Grand Total</b>	<b>0.7</b>	<b>0.4</b>	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.9</b>	<b>0.4</b>	<b>4.4</b>

## 3.2 Development by Segments

“Development by Segments” presents information about regional development for metal goods, electromechanical and electronic products, engineering, building and construction and metal goods. “Market Leaders” give names of identified stainless steel mass consumers.

### 3.2.1 Electromechanical / Electronic Products

The consumption of electromechanical / electronic products was always driven by a small number of applications in the household appliance segment. Data processing and consumer electronics also play an interesting role but stainless steel is only used in very limited volumes per unit. In total, only the larger products such as washing machine drums, interior cladding of tumble dryers and dish washers dominate this segment. Another important usage is stainless steel in domestic cooking for kitchen hoods and cabinet doors of ovens for instance.

Electromechanical uses will remain the smallest market segment in stainless steel consumption. The growth rate for the period 2004 to 2013 (6.3% p.a.) is estimated to remain on the current level. To remain stable, several conditions have to be met: a) the use of stainless steel in place of plastics and other materials must increase in America, b) the European fashion to use stainless steel for cabinet parts must continue to increase (despite higher raw material prices) and c) demand for appliances must grow in popularity in emerging markets.

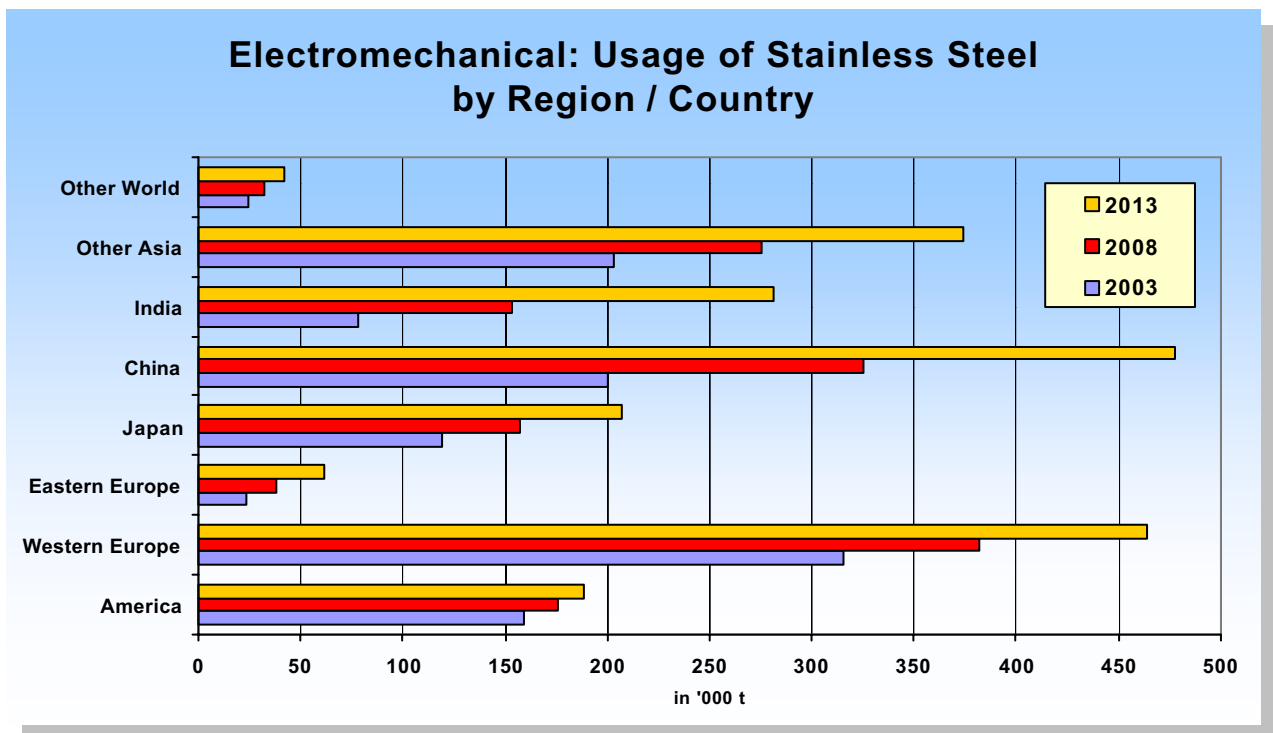
It is expected that stainless steel will remain the most fashionable material in the appliance segment.

Some of the leading white good / appliance / small appliance makers are presented below:

Western Europe: BSH-Hausgeräte, Candy, Elco Brandt, Electrolux, Merloni, Miele, SEB Group, Whirlpool Europe

North America: General Electrics, Maytag, Whirlpool

Selected Asia: Haier, LG, Samsung



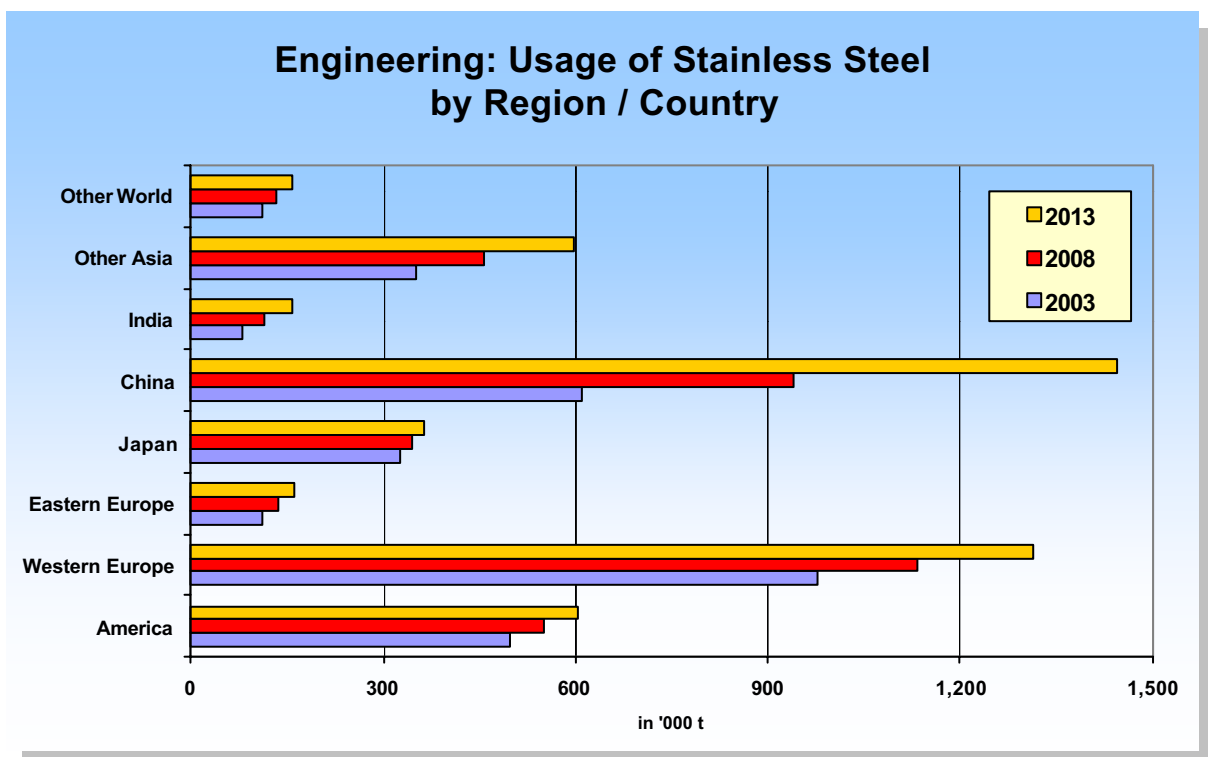
## End Use of Stainless Steel: Electronics / Electromechanical

Region / Sector	Actual			Growth Rate 93 - 03 in % p.a.	Forecast			Growth Rate 04 - 13 in % p.a.	
	1993	2000	2002		2003 e)	2004	2008		2013
	in '000 t								
<b>AMERICA</b>									
Nafta	122	146	132	133	134	138	143	0.8	
Other America	11	24	20	27	29	38	45	4.7	
<b>Total America</b>	<b>133</b>	<b>169</b>	<b>152</b>	<b>160</b>	<b>163</b>	<b>176</b>	<b>188</b>	<b>1.6</b>	
<b>EUROPE</b>									
European Union	176	249	234	294	305	353	424	3.7	
Other Western Europe	11	15	16	22	23	29	39	6.1	
Eastern Europe	7	16	25	23	26	38	62	9.5	
<b>Total Europe</b>	<b>194</b>	<b>280</b>	<b>276</b>	<b>339</b>	<b>354</b>	<b>421</b>	<b>525</b>	<b>4.4</b>	
<b>ASIA</b>									
Japan	67	113	112	119	126	157	207	5.7	
China	38	103	180	200	239	325	478	8.0	
India	13	30	60	78	89	153	281	14.1	
Other Asia	97	154	174	203	216	275	374	6.3	
<b>Total Asia</b>	<b>215</b>	<b>400</b>	<b>526</b>	<b>600</b>	<b>670</b>	<b>911</b>	<b>1,340</b>	<b>8.1</b>	
<b>OTHER WORLD</b>	<b>14</b>	<b>19</b>	<b>21</b>	<b>25</b>	<b>26</b>	<b>32</b>	<b>42</b>	<b>5.3</b>	
<b>TOTAL WORLD</b>	<b>556</b>	<b>868</b>	<b>975</b>	<b>1,124</b>	<b>1,213</b>	<b>1,540</b>	<b>2,095</b>	<b>6.3</b>	

### 3.2.2 Engineering

As explained previously, the demand for engineering goods is mostly driven by engineering projects and investment goods. Future growth can materialise should new plants or equipment be installed at chemical plants or in the food processing and pharmaceutical industries. European, Japanese and American investors are constantly searching for new markets in emerging countries such as Mexico, Brazil, Eastern Europe, China, India and other Asian countries to produce goods cheaply and supply the domestic market. These new facilities could boost the consumption of engineering goods. Also, European and American fabricators are forced to upgrade their own equipment and technologies and this can further boost this segment.

It is expected that the major usage regions in the engineering sector will be China and Western Europe by 2013. China will increase its consumption because of two aspects: a) producers of standard engineering products will continue to shift operations and production to China (heat exchangers, vessels for instance) and b) China is also the region in which many Western and Other Asian companies will invest their money in new projects.



## End Use of Stainless Steel: Engineering

Region / Sector	Actual				Growth Rate		Forecast			Growth Rate 04 - 13 in % p.a.
	1993	2000	2002	2003 e)	93 - 03 in % p.a.	2004	2008	2013		
	in '000 t				in '000 t					
<b>AMERICA</b>										
Nafta	266	400	370	408	3.2	421	436	457	0.9	
Other America	57	88	75	91	4.9	95	115	147	4.9	
<b>Total America</b>	<b>323</b>	<b>489</b>	<b>446</b>	<b>499</b>	<b>3.5</b>	<b>516</b>	<b>551</b>	<b>604</b>	<b>1.8</b>	
<b>EUROPE</b>										
European Union	614	884	837	908	3.2	936	1,061	1,241	3.2	
Other Western Europe	43	61	66	70	5.0	68	70	73	0.8	
Eastern Europe	29	78	96	110	14.1	116	136	163	3.6	
<b>Total Europe</b>	<b>687</b>	<b>1,023</b>	<b>999</b>	<b>1,088</b>	<b>4.0</b>	<b>1,121</b>	<b>1,267</b>	<b>1,477</b>	<b>3.1</b>	
<b>ASIA</b>										
Japan	267	269	295	328	1.0	332	345	363	1.0	
China	110	273	503	610	18.9	665	939	1,445	9.0	
India	30	63	85	82	6.8	88	114	159	6.8	
Other Asia	183	273	306	351	5.5	370	458	598	5.5	
<b>Total Asia</b>	<b>590</b>	<b>878</b>	<b>1,189</b>	<b>1,372</b>	<b>7.7</b>	<b>1,455</b>	<b>1,857</b>	<b>2,564</b>	<b>6.5</b>	
<b>OTHER WORLD</b>	<b>57</b>	<b>79</b>	<b>96</b>	<b>113</b>	<b>6.5</b>	<b>115</b>	<b>134</b>	<b>158</b>	<b>3.6</b>	
<b>TOTAL WORLD</b>	<b>1,657</b>	<b>2,469</b>	<b>2,729</b>	<b>3,071</b>	<b>5.4</b>	<b>3,207</b>	<b>3,810</b>	<b>4,803</b>	<b>4.6</b>	

### 3.2.3 Building & Construction

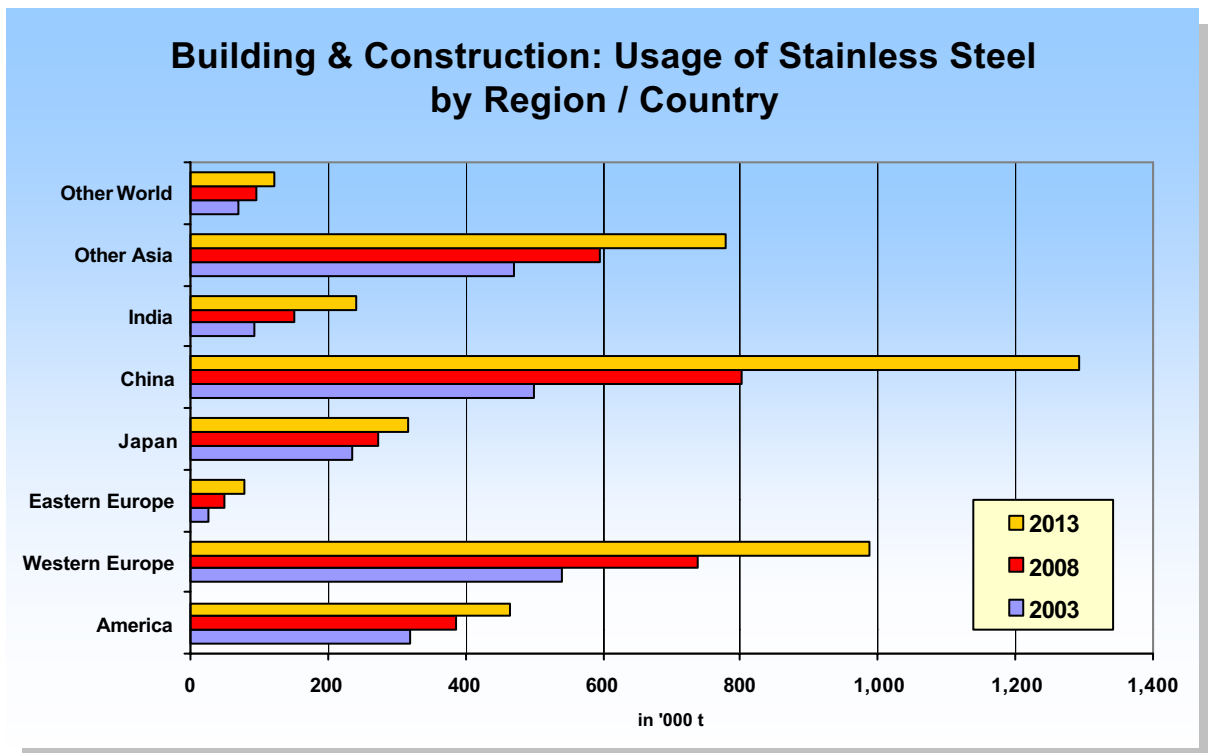
In the Building and Construction end use sectors there are three main regions: China, Western Europe and Other Asia. The successful products in these sectors include: sinks, elevators, heating and air-conditioning. Street furniture, stainless steel panels and water tubing systems have increased in popularity during the last decade, especially in Asia. This development also influenced Europe and America in the late 1990s. In Europe, stainless steel water tubing systems for swimming pools became very popular. These product could also be successful in Asia for instance.

In total, building and construction is expected to grow explosively in the period from 2004 to 2013. It can reach an annual growth rate of 6.5% compared to a total average growth of 5.2% p.a. for all segments combined.

Market leaders of interest were identified in the segment “sinks and sanitaryware”.

Western Europe: Blanco, Franke, Rieber

North America: Callista, Kohler, Kindred



## End Use of Stainless Steel: Building & Construction

Region / Sector	Actual			Growth Rate 93 - 03 in % p.a.	Forecast			Growth Rate 04 - 13 in % p.a.	
	1993	2000	2002		2003 e)	2004	2008		2013
	in '000 t						in '000 t		
<b>AMERICA</b>									
Nafta	173	320	281	292	303	353	428	3.9	
Other America	21	27	23	29	29	32	36	2.3	
<b>Total America</b>	<b>194</b>	<b>347</b>	<b>304</b>	<b>321</b>	<b>333</b>	<b>386</b>	<b>464</b>	<b>3.8</b>	
<b>EUROPE</b>									
European Union	226	533	514	508	550	690	910	5.6	
Other Western Europe	7	23	29	33	35	47	78	9.3	
Eastern Europe	3	22	24	27	34	50	77	9.8	
<b>Total Europe</b>	<b>236</b>	<b>578</b>	<b>567</b>	<b>568</b>	<b>619</b>	<b>787</b>	<b>1,065</b>	<b>6.1</b>	
<b>ASIA</b>									
Japan	352	234	232	235	242	272	316	3.0	
China	79	256	443	499	548	803	1,293	10.0	
India	4	30	73	93	103	150	242	10.0	
Other Asia	183	334	396	470	495	596	778	5.2	
<b>Total Asia</b>	<b>618</b>	<b>855</b>	<b>1,144</b>	<b>1,296</b>	<b>1,388</b>	<b>1,821</b>	<b>2,628</b>	<b>7.4</b>	
<b>OTHER WORLD</b>	<b>29</b>	<b>47</b>	<b>58</b>	<b>69</b>	<b>72</b>	<b>94</b>	<b>120</b>	<b>5.9</b>	
<b>TOTAL WORLD</b>	<b>1,078</b>	<b>1,827</b>	<b>2,073</b>	<b>2,254</b>	<b>2,412</b>	<b>3,088</b>	<b>4,277</b>	<b>6.5</b>	

### 3.2.4 Metal Goods

Metal goods encompass a large number of different products. These products are normally costly to produce. For instance, European companies are not active in the polishing of tableware as labour cost in Europe (and also America) are too high. The production of metal goods is unsophisticated but labour intensive.

Therefore, high labour cost countries producers have shifted their production to low-cost regions such as Asia in the last decade. It is not clear whether this will be a permanent fixture and producers might continue to migrate facilities to cheaper countries. Metal goods is the offset industry for stainless steel supply.

To date, China, India, Vietnam and Indonesia are countries with a strong position in metal goods (particularly cutlery and flat- and hollow-ware) fabrication. China also invested in new facilities (for instance Rixing) for this type of production.

The quality of products is similar but often better than in some of the old European or American factories. It is estimated that China will remain the leading region for metal goods production world wide, notwithstanding the fact that China and India are the only important countries where metal goods is the leading application. Smaller Asian countries such as Vietnam are increasing their market share.

Market leaders shown below represent manufacturers of cutlery, pots and pans and catering equipment.

Western Europe: Alessi, ALI Group, Fissler, Hobart, SEB Group (Tefal), Viscout, WMF

North America: Elkay, Hobart, Vollrath

Selected Asia : Artstar, Rixing

## End Use of Stainless Steel: Metal Goods

Region / Sector	Actual			Growth Rate		Forecast			Growth Rate	
	1993	2000	2002	2003 e)	93 - 03	2004	2008	2013	04 - 13	
	in '000 t			in % p.a.		in '000 t			in % p.a.	
<b>AMERICA</b>										
Nafta	252	246	222	222	-2.5	222	220	218	-0.2	
Other America	30	37	28	32	0.9	33	34	35	0.9	
<b>Total America</b>	<b>282</b>	<b>283</b>	<b>251</b>	<b>255</b>	<b>-2.1</b>	<b>254</b>	<b>254</b>	<b>253</b>	<b>-0.1</b>	
<b>EUROPE</b>										
European Union	330	494	428	416	1.9	423	456	499	1.9	
Other Western Europe	29	43	45	50	5.5	48	48	62	3.8	
Eastern Europe	15	43	53	72	16.7	67	85	120	7.3	
<b>Total Europe</b>	<b>374</b>	<b>579</b>	<b>526</b>	<b>537</b>	<b>3.1</b>	<b>538</b>	<b>588</b>	<b>682</b>	<b>2.8</b>	
<b>ASIA</b>										
Japan	203	235	208	204	-0.3	203	203	203	0.0	
China	214	565	961	1,070	18.7	1,269	1,695	2,434	7.5	
India	142	306	516	549	10.9	609	801	976	5.6	
Other Asia	251	311	328	363	2.5	372	411	466	2.5	
<b>Total Asia</b>	<b>810</b>	<b>1,418</b>	<b>2,014</b>	<b>2,185</b>	<b>9.5</b>	<b>2,454</b>	<b>3,111</b>	<b>4,079</b>	<b>5.9</b>	
<b>OTHER WORLD</b>	<b>45</b>	<b>62</b>	<b>75</b>	<b>89</b>	<b>6.5</b>	<b>91</b>	<b>109</b>	<b>129</b>	<b>4.1</b>	
<b>TOTAL WORLD</b>	<b>1,511</b>	<b>2,342</b>	<b>2,865</b>	<b>3,066</b>	<b>6.4</b>	<b>3,338</b>	<b>4,061</b>	<b>5,143</b>	<b>5.0</b>	

