ACRYLONITRILE AND DERIVATIVES

World Supply/Demand Report

2009

PCI Acrylonitrile Ltd

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The **Acrylonitrile and Derivatives World Supply/Demand Report 2009** is now available.

The report was due to be issued in December 2009 but we thought it best to delay publishing to get a better view of the Q4 2009 situation and therefore hopefully to get a better handle on the forecast numbers. Many in the industry expected that Q4 2009 would see a dramatic tail off in activity but this did not happen. On this basis we believe that the correct decision was made to delay issuing the report. We believe that the report is a better and more useful document on this basis.

Companies involved in the industry who have not subscribed to the supply/demand report in the past or who have not yet ordered the 2009 edition are strongly encouraged to take a subscription. The report is a cost effective piece of intelligence giving a full historic data base for the industry and offering an independent view of the future direction. It is important that companies involved in the industry understand the dynamics of the business in order to make better decisions.

The report is a useful planning tool for acrylonitrile producers, consumers and traders. The development of acrylonitrile capacity is one side of the equation. Acrylonitrile demand from its various derivatives is the other and the demand prospects for each derivative is analysed (including capacity development). The demand side and the supply side are put together in order to understand how the market balance is likely to develop in the coming years.

Following stable acrylonitrile demand during 2004/2005/2006, acrylonitrile demand increased 1.2% in 2007 to reach the highest total ever. Following a promising start to 2008, the dramatic global economic problems that were seen in the second half of the year along with the collapse in the oil price, caused demand to slump towards the end of the year. The acrylonitrile market in 2008 totalled 4.531 million tons, a decrease of 719,000 tons or 13.7%.

Our forecast for 2009 is that acrylonitrile demand will increase by 5.5%, (+248,000 tons) to 4.779 million tons. Acrylonitrile demand in 2010 is forecast to grow by 4.9%, (+234,000 tons). This is based on the continual recovery in the world economy coupled with a rebuild of pipeline stocks which we believe were very low at the end of 2009. We see demand growth from all derivatives with the strongest volume growth from the ABS/SAN sector.

Acrylonitrile demand growth is forecast at 3.7% per year on average for the period 2008-2018. This growth rate is perhaps a little misleading however as it starts from a very low base. Total acrylonitrile demand in 2018 is forecast at 6.516 million tons.

The acrylonitrile supply/demand balance is forecast to improve over the coming years as capacity is added slightly behind forecast demand growth. The timing of capacity additions will be critical for the market however, as any significant delay could cause a tightness to develop as was seen in 2007.

Acrylic fibre has lost market share (mainly to polyester), due to its relative high price. This has been evident since 2004. In 2008, acrylic fibre lost a substantial volume - 520,000 tons. In 2009, however it regained volume, seeing growth of 127,000 tons. How is it likely to look in the coming years?

Following a sustained period of demand growth, ABS/SAN demand fell by 13% in 2008 (960,000 tons) to 6.338 million tons. This followed growth of 6% in 2007 (413,000 tons). The dramatic global economic problems that were seen in 2008 were the background to the decline. Initially 2008 looked strong but the rapid negative changes that were seen in the global economic environment hit hard in Q3 and Q4 and a massive de-stocking took place. ABS/SAN demand in 2009 saw a recovery. Our forecast suggests that the market grew by 7.3% to reach 6.803 million tons (+465,000 tons). This is however, still behind the market size in 2007. What next?

Acrylamide looks to be moving into a period of strong growth with significant new capacity being added to feed the demand. Carbon fibre demand has stalled but is expected to recover strongly. NB Copolymers continue to show solid growth.

We have taken a close look at future demand for the major derivatives along with the other smaller volume acrylonitrile derivatives. **PCI Acrylonitrile Ltd** believes that its analysis of this industry is the best available. The report has been researched and prepared by **Simon Garmston** (with 22 years consulting experience to this industry).

The 2009 report totals 292 pages. Historic data years run 2003-2008, while forecasts run 2009-2018. The report includes capacity information by company for acrylonitrile, acrylic fibre, ABS/SAN, adiponitrile, NB copolymers and acrylamide. Each country in the world that is involved in the production or consumption of acrylonitrile is analysed with data on capacity, production, consumption by derivative, imports and exports shown for historic years and forecast to 2018. The country detail is consolidated into regional and world level data. There are sections on demand for acrylic fibre, demand for ABS/SAN and acrylonitrile trade. There is a section that shows plant location maps. In addition to the hard copy, a CD is included containing all data back to 1986.

If you wish to place an order or need further information please make contact.

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Managing Director
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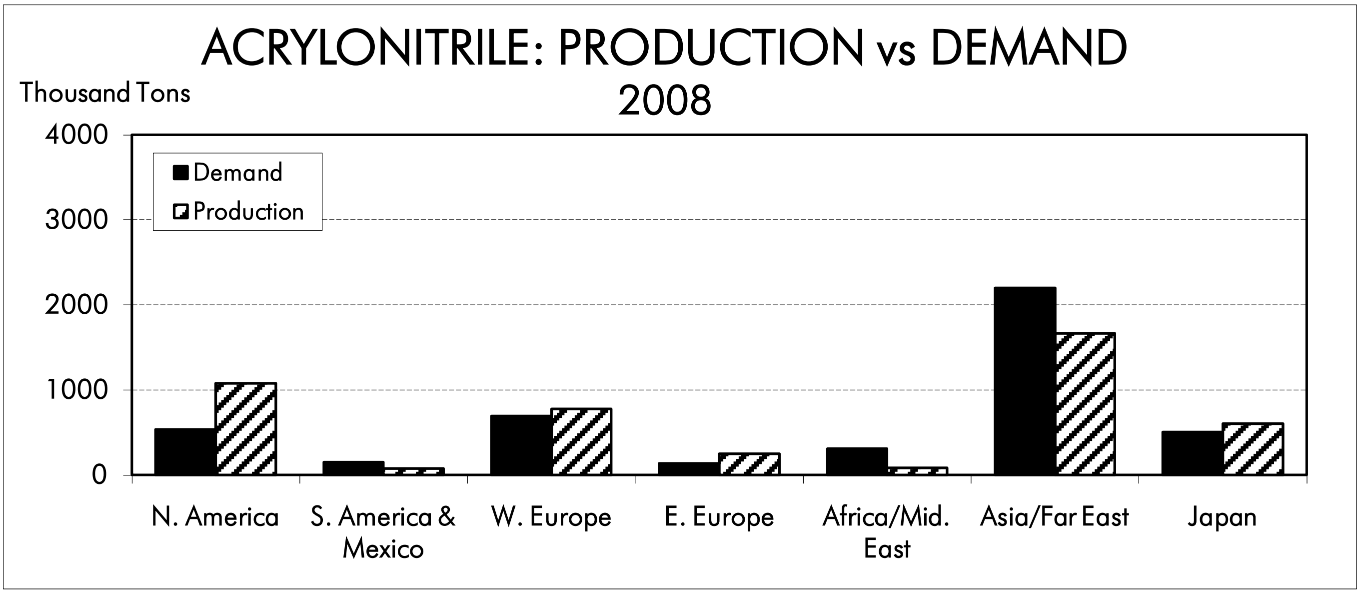
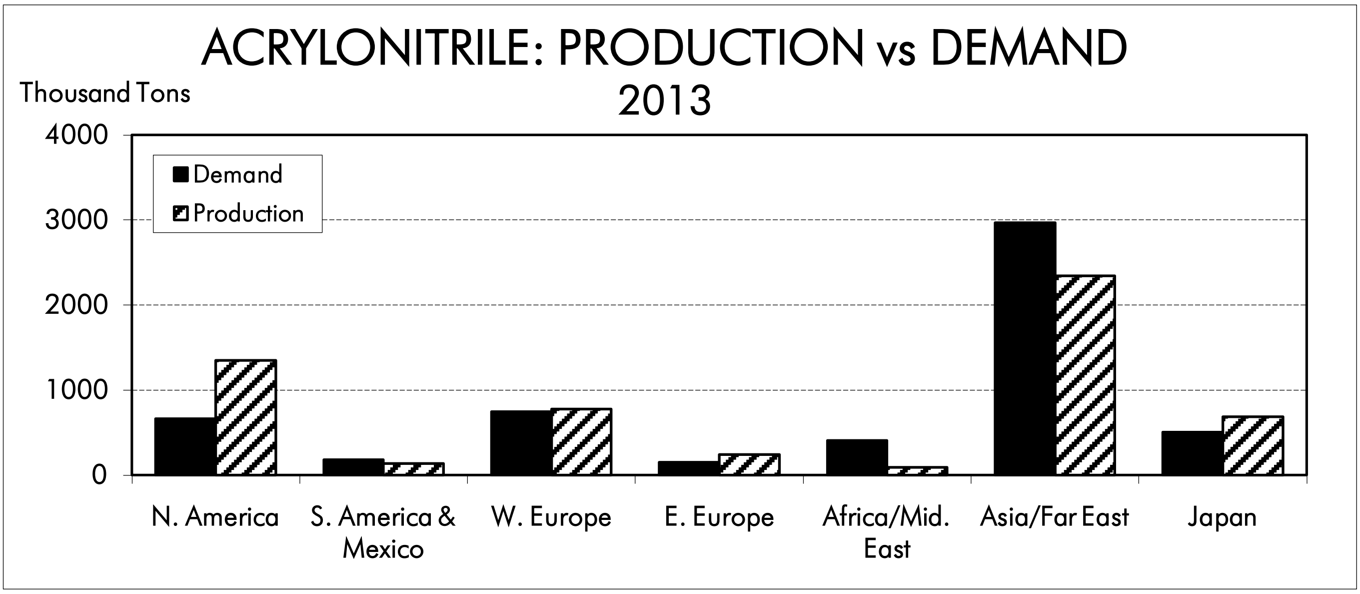
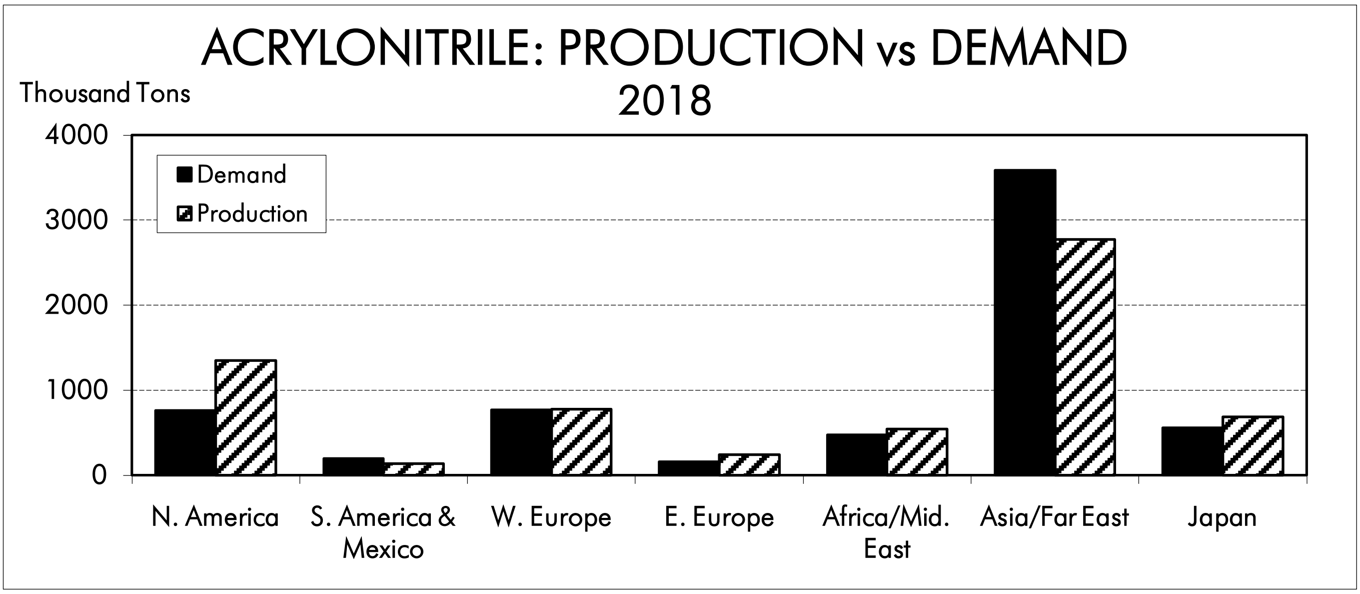

ACRYLONITRILE: PRODUCTION vs DEMAND
2008
Thousand Tons
4000
3000
2000
1000
0
Demand
Production
N. America
S. America & Mexico
W. Europe
E. Europe
Africa/Mid. East
Asia/Far East
Japan


ACRYLONITRILE: PRODUCTION vs DEMAND
2013
Thousand Tons
4000
3000
2000
1000
0
Demand
Production
N. America
S. America & Mexico
W. Europe
E. Europe
Africa/Mid. East
Asia/Far East
Japan


ACRYLONITRILE: PRODUCTION vs DEMAND
2018
Thousand Tons
4000
3000
2000
1000
0
Demand
Production
N. America
S. America & Mexico
W. Europe
E. Europe
Africa/Mid. East
Asia/Far East
Japan

ASIA/FAR EAST ('000 TONS)

ACRYLONITRILE

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Capacity	1506	1703	1963	2051	2088	2125	2133	2203	2348	2603	2603	2603	2733	2863	2863	3033
Production	1336	1530	1714	1880	1842	1665	1856	1901	2051	2318	2341	2342	2499	2605	2610	2772
Utilisation	89%	90%	87%	92%	88%	78%	87%	86%	87%	89%	90%	90%	91%	91%	91%	91%
Consumption																
Acrylic Fibre	1010	1076	1102	1135	1111	841	955	932	937	928	928	937	936	935	935	935
ABS/SAN	888	969	1014	1084	1202	1071	1237	1323	1408	1468	1557	1651	1734	1812	1892	1987
Adiponitrile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acrylamide	93	110	117	120	133	158	184	197	228	243	261	276	292	308	328	348
NB Copolymers	46	53	59	65	69	80	90	109	124	135	148	162	175	189	202	216
Miscellaneous *	12	14	15	17	22	52	57	64	68	72	79	83	87	94	98	102
Total	**2049**	**2222**	**2307**	**2421**	**2537**	**2202**	**2523**	**2625**	**2765**	**2846**	**2973**	**3109**	**3224**	**3338**	**3455**	**3588**
Imports	920	921	977	962	1049	807										
Exports	198	218	388	425	355	272										
Net Trade	-722	-703	-589	-537	-694	-535	-667	-724	-714	-528	-632	-767	-725	-733	-845	-816
Stock Change	9	11	-4	-4	-1	-2	0	0	0	0	0	0	0	0	0	0

ACRYLIC FIBRE

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Capacity	1190	1280	1356	1322	1328	1237	1105	1143	1155	1155	1155	1155	1155	1155	1155	1155
Production	1080	1135	1172	1206	1173	887	1007	991	996	986	986	996	1001	1001	1001	1001
Utilisation	91%	89%	86%	91%	88%	72%	91%	87%	86%	85%	85%	86%	87%	87%	87%	87%
ACN Required	1010	1076	1102	1135	1111	841	955	932	937	928	928	937	936	935	935	935

ABS/SAN

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Capacity	4471	4612	4792	5026	5438	5848	5888	6188	6563	6913	7228	7453	7628	7978	8303	8728
Production	3676	3897	4127	4451	4898	4310	4948	5293	5635	5870	6225	6605	6935	7250	7565	7945
Utilisation	82%	84%	86%	89%	90%	74%	84%	86%	86%	85%	86%	89%	91%	91%	91%	91%
ACN Required	888	969	1014	1084	1202	1071	1237	1323	1408	1468	1557	1651	1734	1812	1892	1987

ACRYLAMIDE

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Capacity	186	236	246	246	274	327	327	327	377	397	417	437	457	477	497	517
Production	125	147	156	160	177	211	245	263	304	324	348	368	390	411	437	464
Utilisation	67%	62%	63%	65%	65%	65%	75%	80%	81%	82%	83%	84%	85%	86%	88%	90%
ACN Required	93	110	117	120	133	158	184	197	228	243	261	276	292	308	328	348

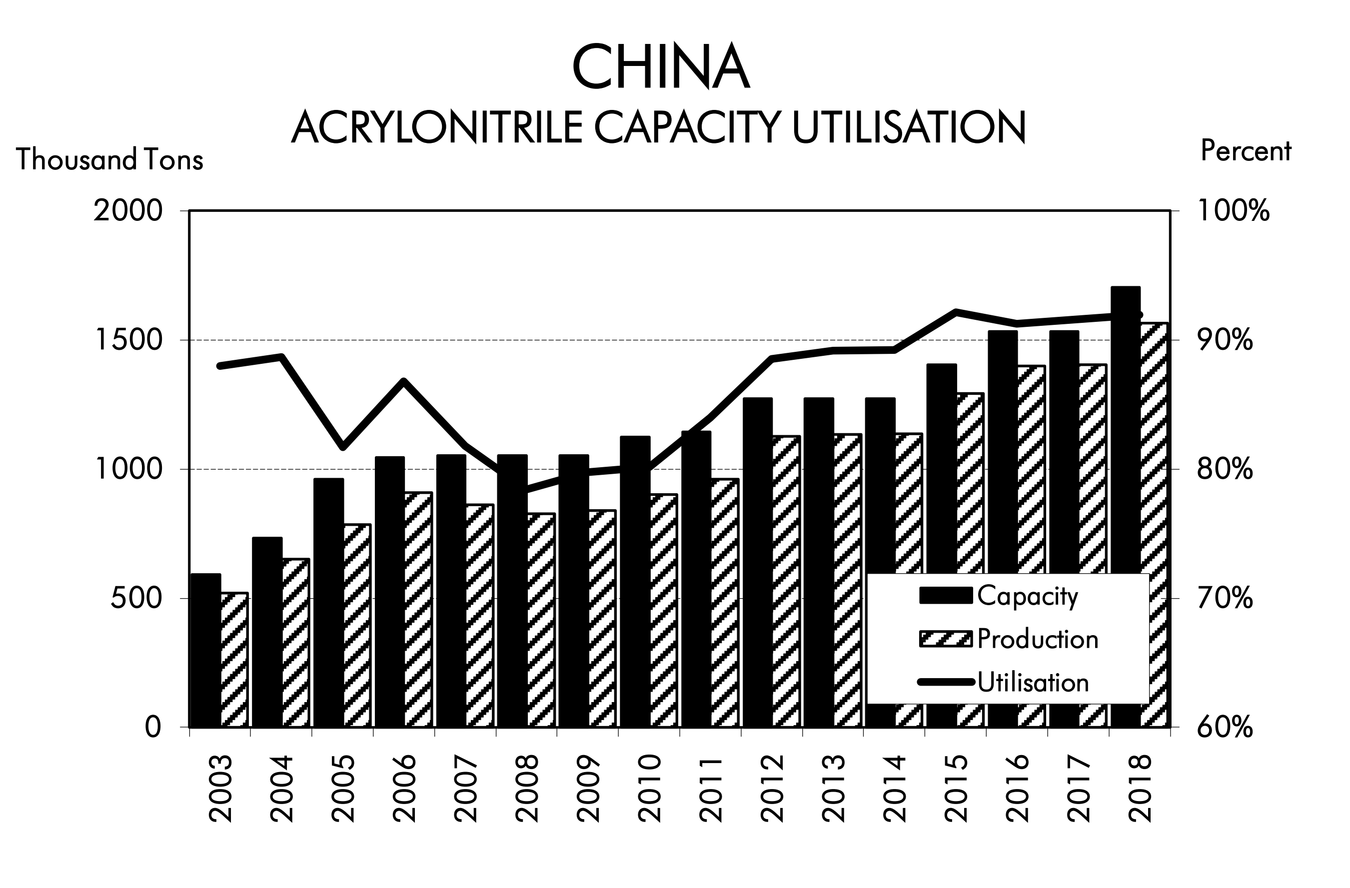
NB COPOLYMERS

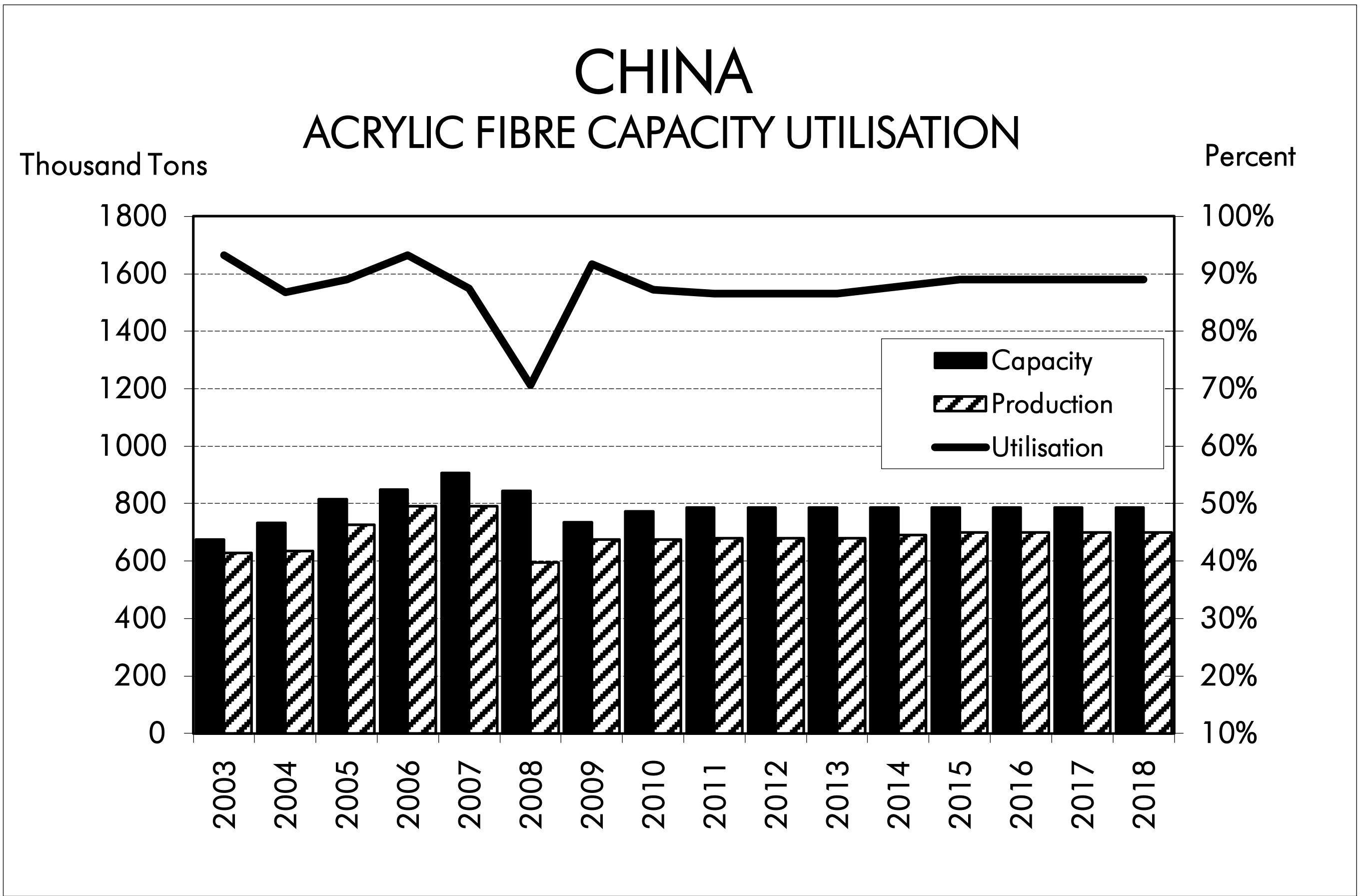
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Capacity	186	212	242	257	296	344	376	509	519	529	564	594	629	659	694	724
Production	140	162	183	201	215	246	275	337	387	417	459	500	542	583	625	666
Utilisation	75%	76%	76%	78%	73%	72%	73%	66%	75%	79%	81%	84%	86%	88%	90%	92%
ACN Required	46	53	59	65	69	80	90	109	124	135	148	162	175	189	202	216

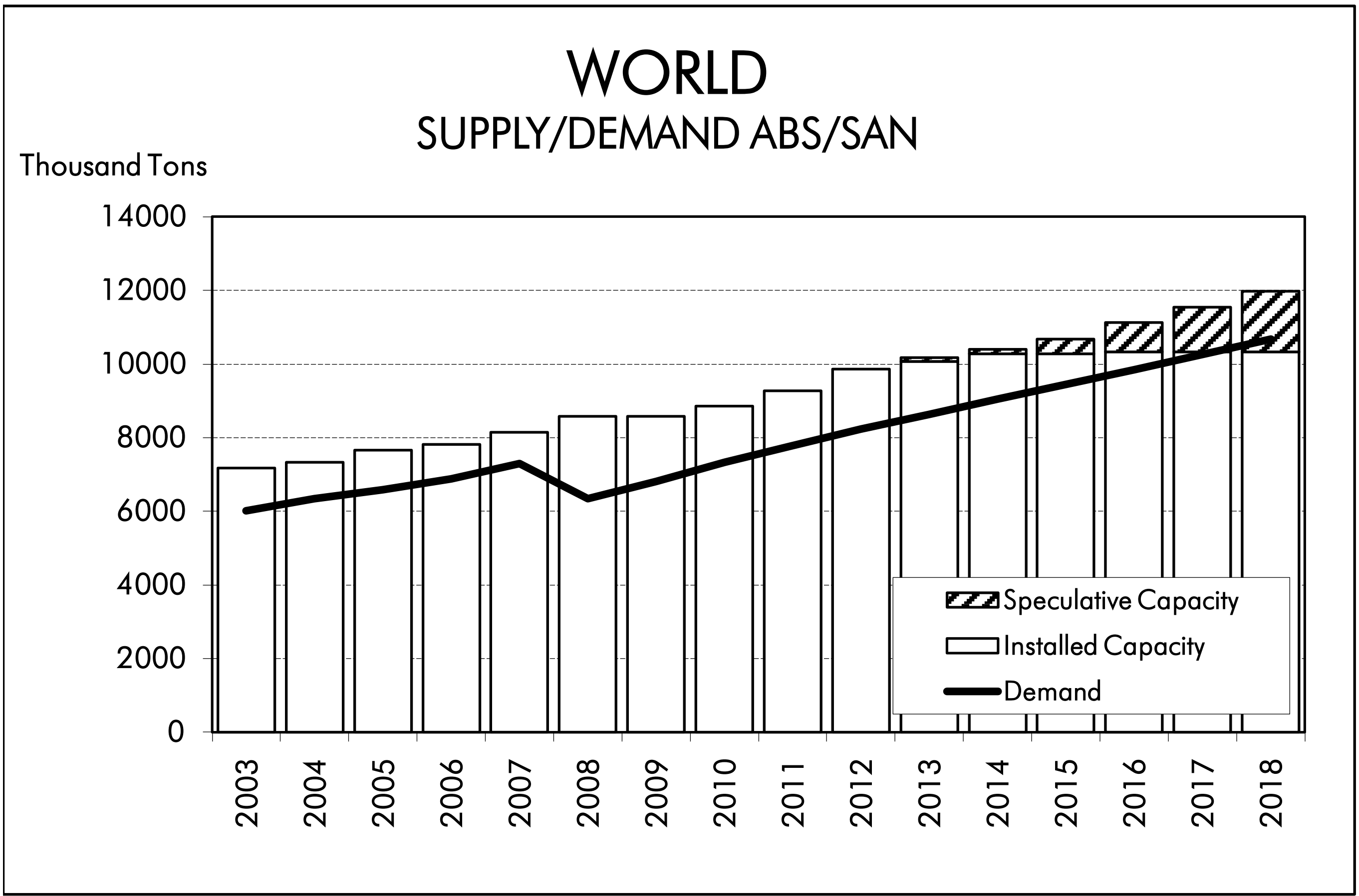
Note:

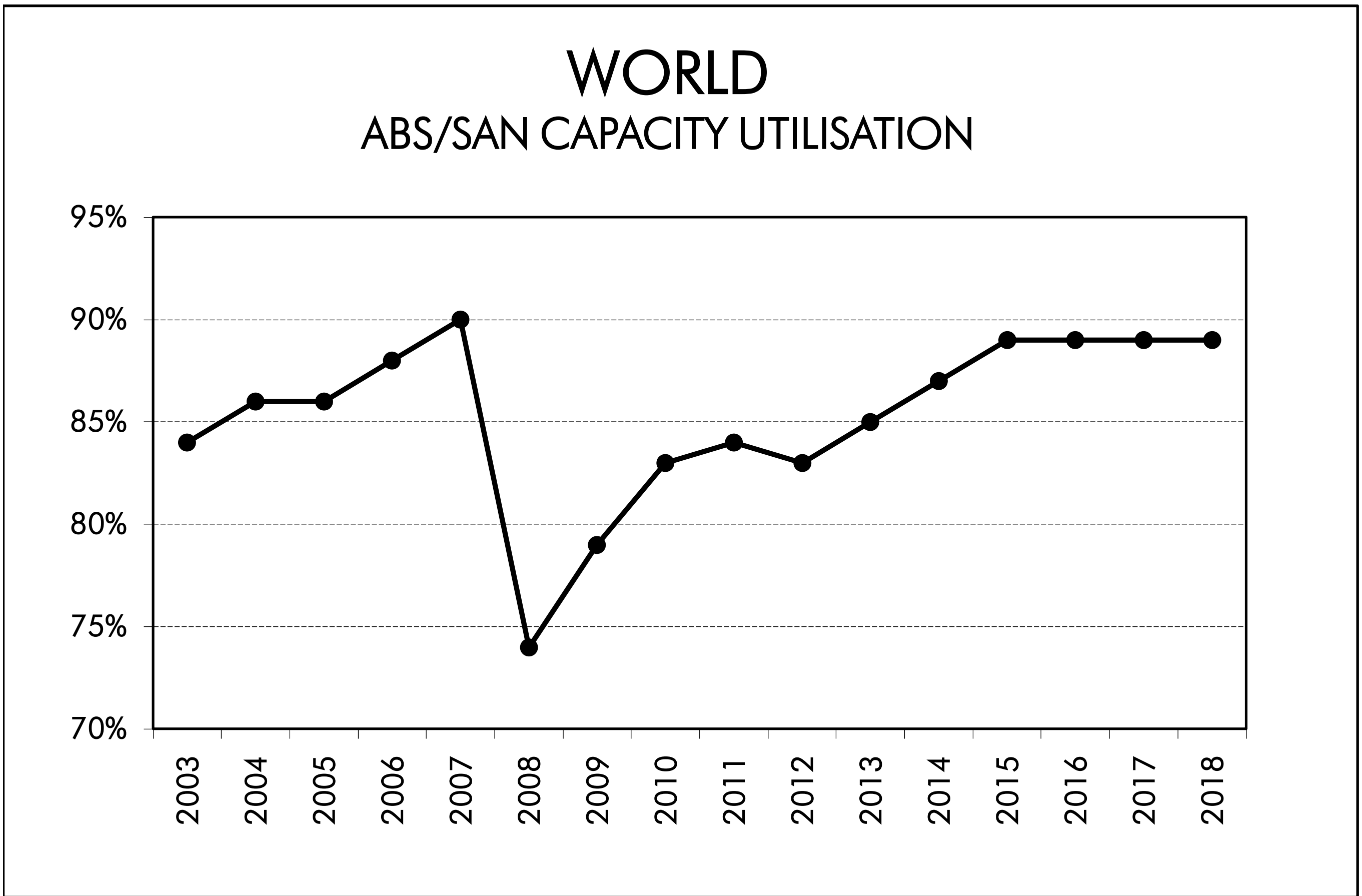
Speculative acrylonitrile capacity added totalling 430,000 tons by 2018
Speculative ABS/SAN capacity added totalling 1,350,000 tons by 2018
Speculative NB Copolymer capacity added totalling 135,000 tons by 2018
Speculative acrylamide capacity added totalling 140,000 tons by 2018

* Includes Carbon Fibre Precursor


CHINA
ACRYLONITRILE CAPACITY UTILISATION
Thousand Tons
Percent
2000
1500
1000
500
0
100%
90%
80%
70%
60%
Capacity
Production
Utilisation
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


CHINA
ACRYLIC FIBRE CAPACITY UTILISATION
Thousand Tons
Percent
1800
1600
1400
1200
1000
800
600
400
200
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
Capacity
Production
Utilisation
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


WORLD
SUPPLY/DEMAND ABS/SAN
Thousand Tons
14000
12000
10000
8000
6000
4000
2000
0
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Speculative Capacity
Installed Capacity
Demand


WORLD
ABS/SAN CAPACITY UTILISATION
95%
90%
85%
80%
75%
70%
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

ACRYLONITRILE PRODUCTION CAPACITIES ('000 TONS)

ASIA/FAR EAST

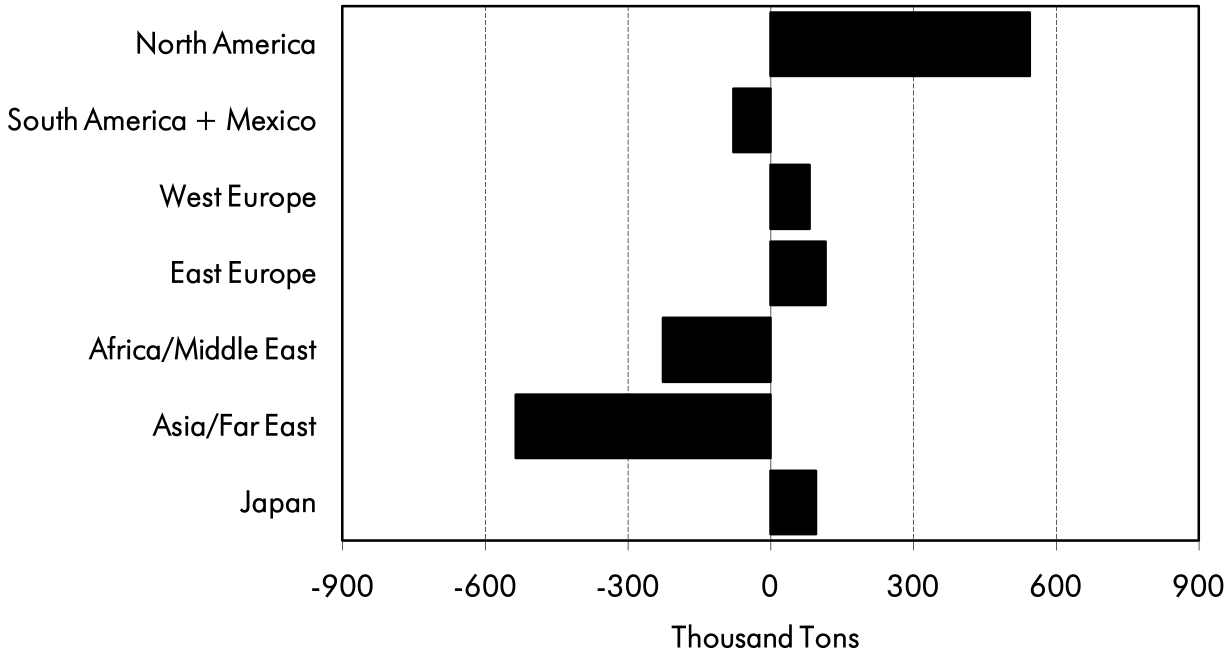
Producer	Location	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Notes
INDIA																		
Reliance	Vadodara, Gujarat	35	40	42	45	50	50	50	50	50	50	50	50	50	50	50	50	(46)
	Dahej, Gujarat	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(47)
	Jamnagar, Gujarat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(48)
	Company Total	*35*	*40*	*42*	*45*	*50*	*50*	*50*	*50*	*50*	*50*	*50*	*50*	*50*	*50*	*50*	*50*	
Speculative Capacity	*Unknown*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	(49)
	Country Total	35	40	42	45	50	50	50	50	50	50	50	50	50	50	50	50	
SOUTH KOREA																		
Tong Suh Petrochemical	Ulsan - No 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(50)
	Ulsan - No 2	70	70	70	70	35	62	70	70	70	70	70	70	70	70	70	70	(51)
	Ulsan - No 3	170	200	200	200	230	230	230	230	230	230	230	230	230	230	230	230	(52)
	Company Total	*240*	*270*	*270*	*270*	*265*	*292*	*300*	*300*	*300*	*300*	*300*	*300*	*300*	*300*	*300*	*300*	
Tae Kwang	Ulsan	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	(53)
	Country Total	490	520	520	520	515	542	550	550	550	550	550	550	550	550	550	550	
TAIWAN																		
CPDC	Ta-Sheh	95	95	100	100	100	100	100	100	125	125	125	125	125	125	125	125	(54)
	Ta-Sheh	95	95	100	100	100	100	100	100	100	125	125	125	125	125	125	125	
	Company Total	*190*	*190*	*200*	*200*	*200*	*200*	*200*	*200*	*225*	*250*	*250*	*250*	*250*	*250*	*250*	*250*	
Formosa Plastics	Mailiao	200	220	240	240	270	280	280	280	280	280	280	280	280	280	280	280	(55)
	Country Total	390	410	440	440	470	480	480	480	505	530	530	530	530	530	530	530	
THAILAND																		
PTT Asahi Chemical Co Ltd	Map Ta Phut	0	0	0	0	0	0	0	0	100	200	200	200	200	200	200	200	(56)
	Region Total	1506	1703	1963	2051	2088	2125	2133	2203	2348	2603	2603	2603	2733	2863	2863	3033	

ABS/SAN PRODUCTION CAPACITIES ('000 TONS)

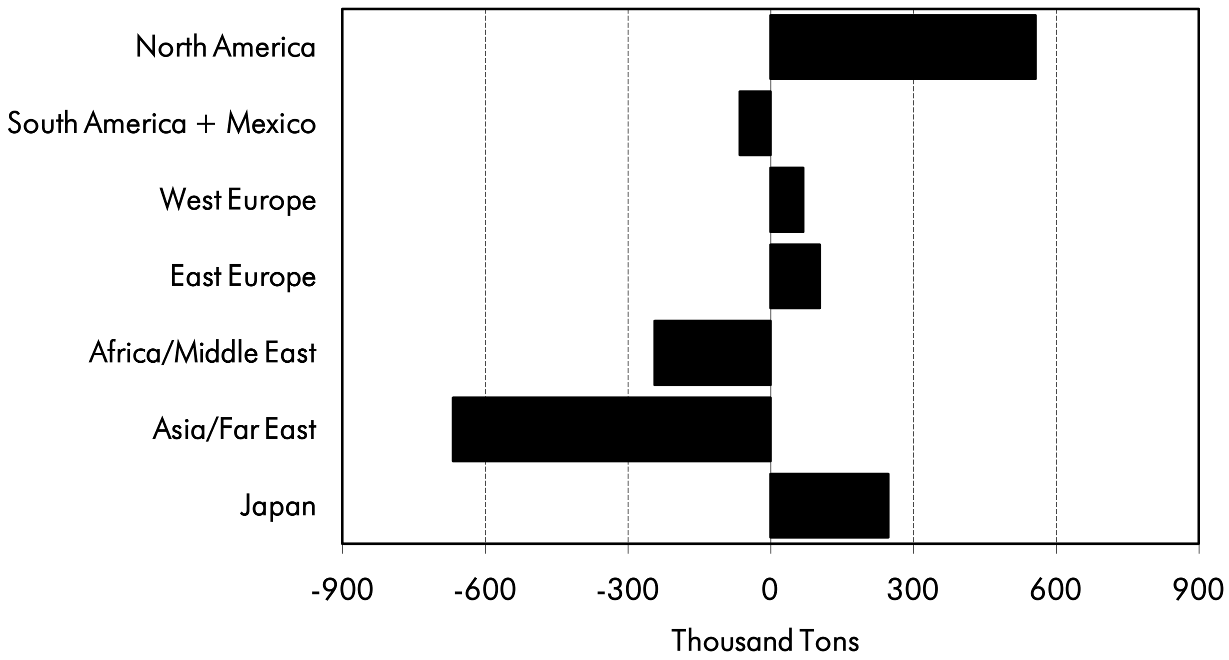
ASIA/FAR EAST

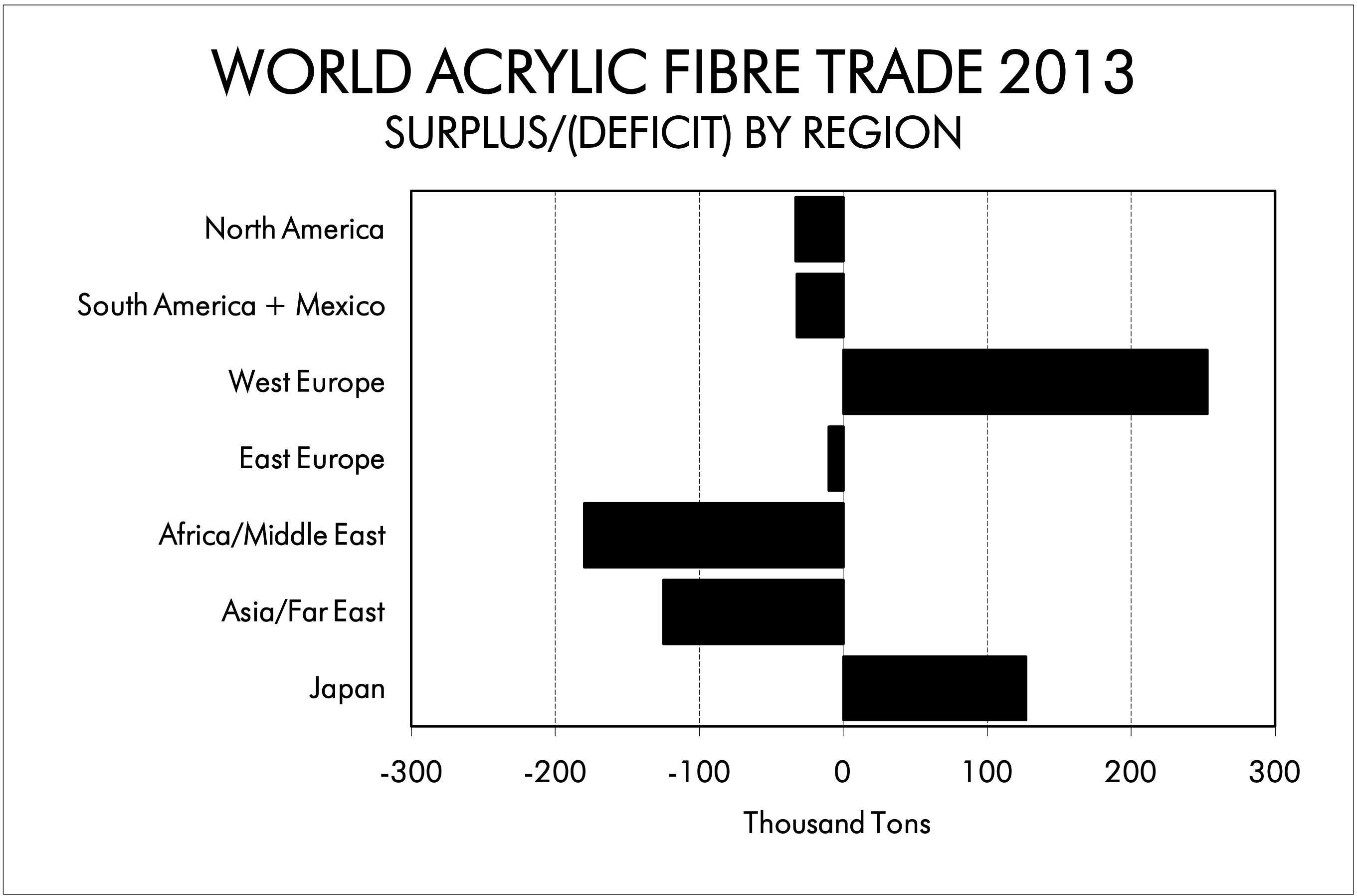
Producer	Location	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Product	Notes
AUSTRALIA																			
Huntsman Chem Australia	Dandenong, Victoria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ABS	
	West Footscray, Victoria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ABS	
	Country Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
CHINA																			
Chi Mei	Zhengjiang, Jiangsu	200	200	200	200	200	250	250	350	350	350	350	350	350	350	350	350	ABS	(24)
Chi Mei	Zhengjiang, Jiangsu	50	50	50	50	100	100	100	100	100	100	100	100	100	100	100	100	SAN	
Grand Pacific (GPPC)	Zhenjiang, Jiangsu	150	150	150	150	175	250	250	250	250	250	250	250	250	250	250	250	ABS	(25)
	JV Total	*400*	*400*	*400*	*400*	*475*	*600*	*600*	*700*	*700*	*700*	*700*	*700*	*700*	*700*	*700*	*700*		
Changzhou (Shin Ho)	Changzhou, Jiangsu	50	50	50	75	100	100	100	100	100	100	100	100	100	100	100	100	ABS	(26)
Daqing Petrochemical	Daqing, Heilonjiang	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	ABS/SAN	
	Daqing, Heilonjiang	0	0	8	50	50	50	50	150	150	150	150	150	150	150	150	150	ABS	
	Company Total	*50*	*50*	*58*	*100*	*100*	*100*	*100*	*200*	*200*	*200*	*200*	*200*	*200*	*200*	*200*	*200*		
FCFC	Ningbo, Zhejiang	0	70	120	150	225	300	300	300	300	300	300	300	300	300	300	300	ABS	(27)
Gao Qiao Petrochemical Co	Gao Qiao, Shanghai	0	0	0	0	150	225	225	225	225	225	225	225	225	225	225	225	ABS/SAN	(28)
Jilin Chemical Industry	Jilin, Jilin	160	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	ABS/SAN	(29)
	Jilin, Jilin	0	0	0	0	0	0	0	0	0	0	200	400	400	400	400	400		
Lanzhou Petrochemical Co	Lanzhou, Gansu	25	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	ABS/SAN	
LG Chemical/CNOOC	Huizhou, Guandong	0	0	0	0	0	0	0	0	150	300	300	300	300	300	300	300	ABS	(30)
Ningbo LG Yongxing Chemica	Ningbo, Zhejiang	300	300	350	400	500	500	500	500	500	500	500	500	500	500	500	500	ABS	(31)
Panjin Ethylene Industry Corp	Panjin City, Liaoning	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	ABS/SAN	(32)
Tianjin Dagu Chemical Co	Tanggu District, Tianjin	0	0	0	0	0	0	0	100	300	400	400	400	400	400	400	400	ABS	(33)
Speculative Capacity	*Unknown*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*150*	*450*	*750*	*1150*		(34)
	Country Total	1045	1160	1268	1415	1840	2115	2115	2415	2765	3015	3215	3415	3565	3865	4165	4565		

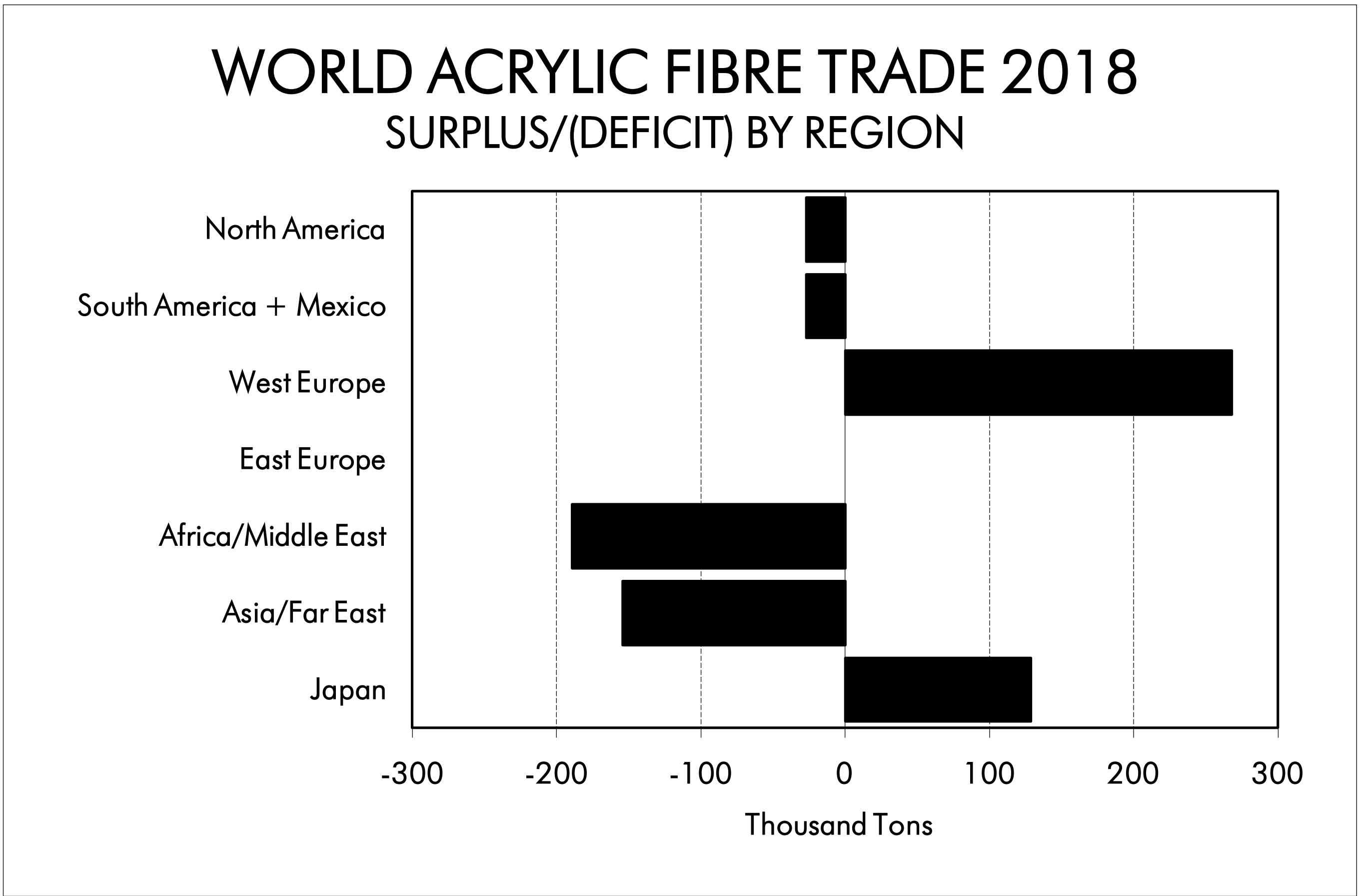
WORLD ACRYLONITRILE TRADE 2008
SURPLUS/(DEFICIT) BY REGION

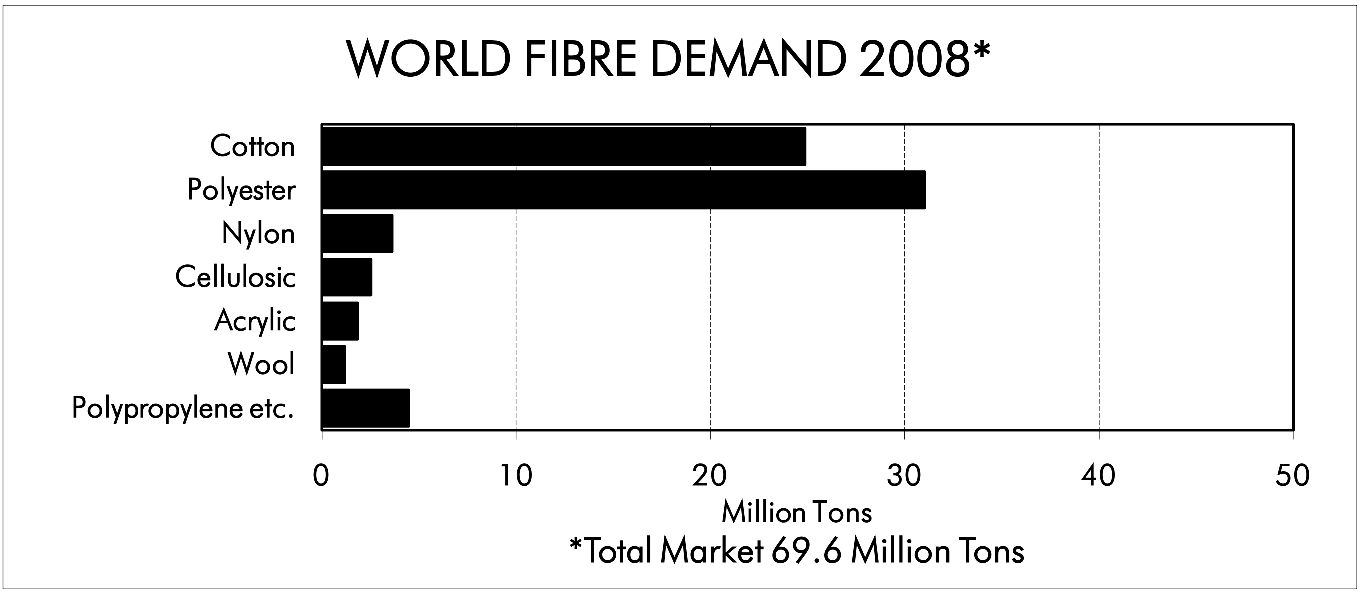


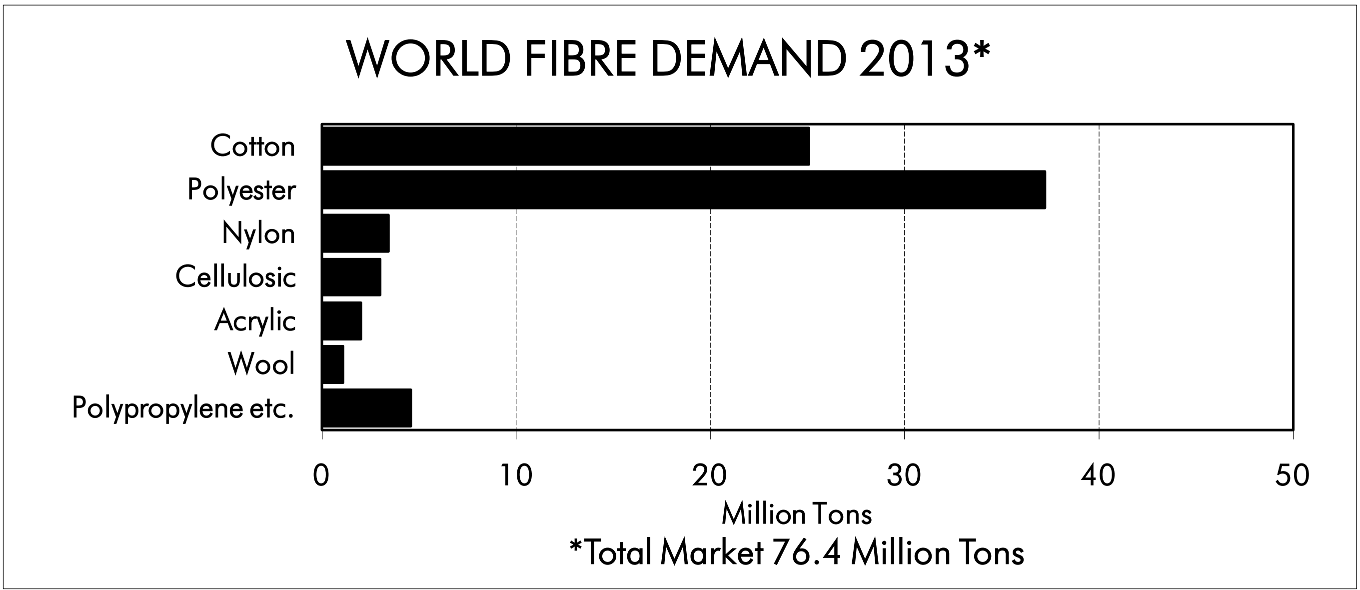
WORLD ACRYLONITRILE TRADE 2009
SURPLUS/(DEFICIT) BY REGION

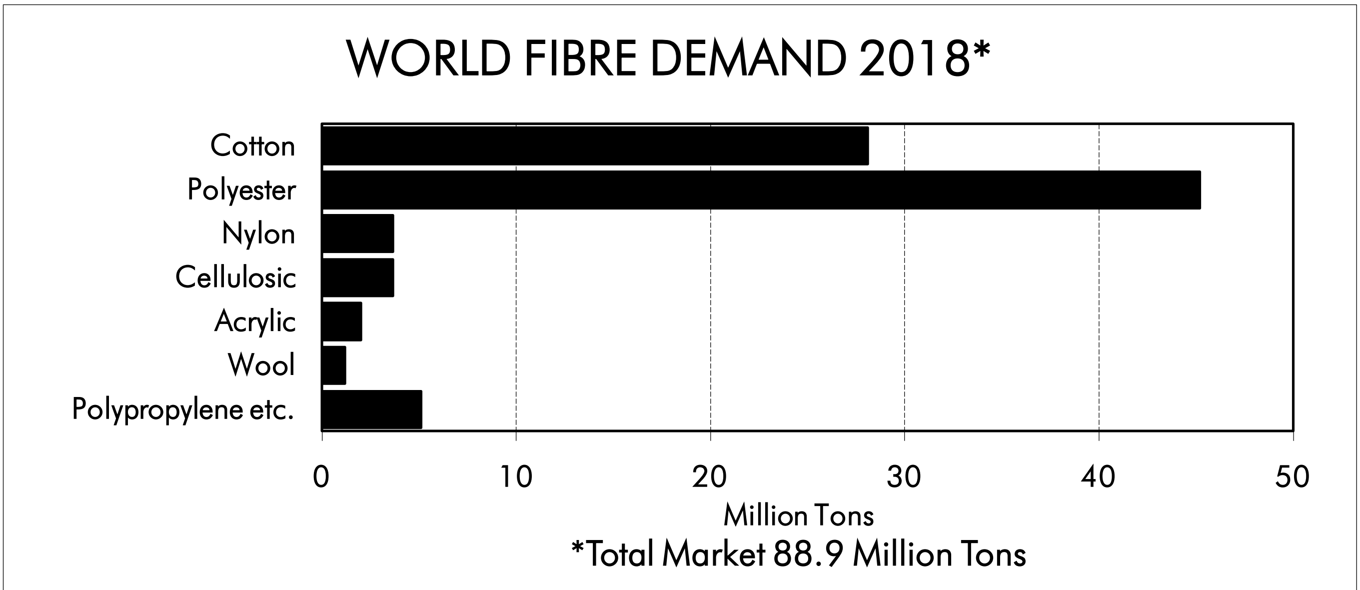


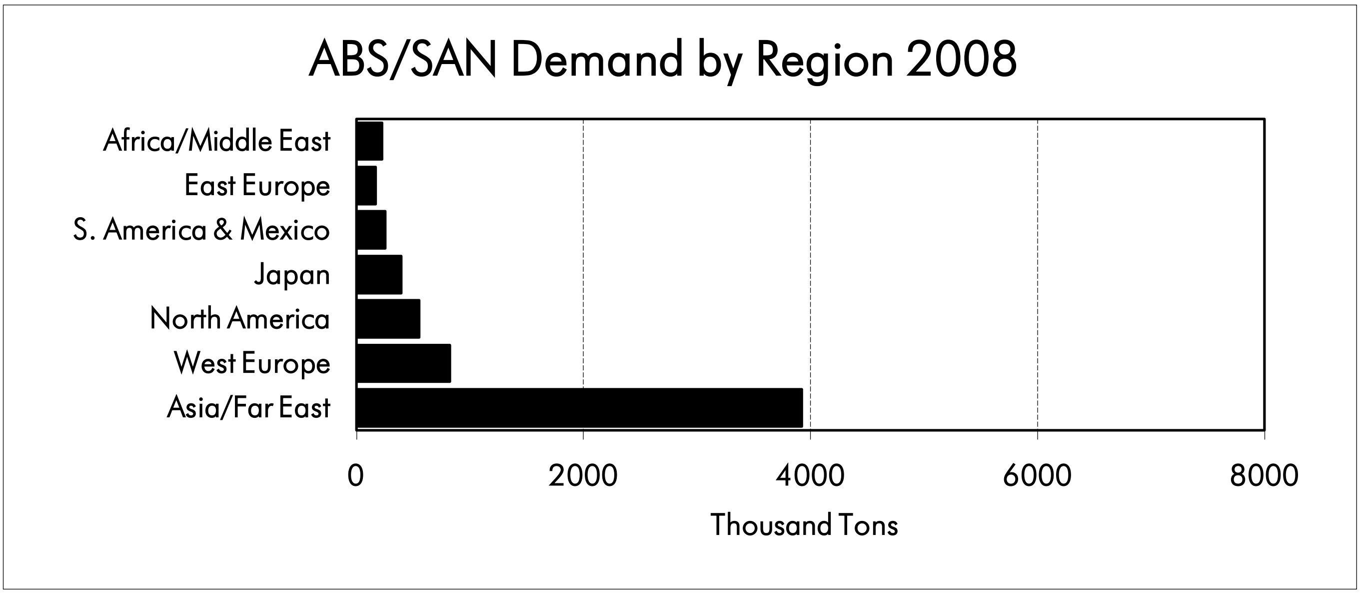

WORLD ACRYLIC FIBRE TRADE 2013
SURPLUS/(DEFICIT) BY REGION
North America
South America + Mexico
West Europe
East Europe
Africa/Middle East
Asia/Far East
Japan
-300
-200
-100
0
100
200
300
Thousand Tons

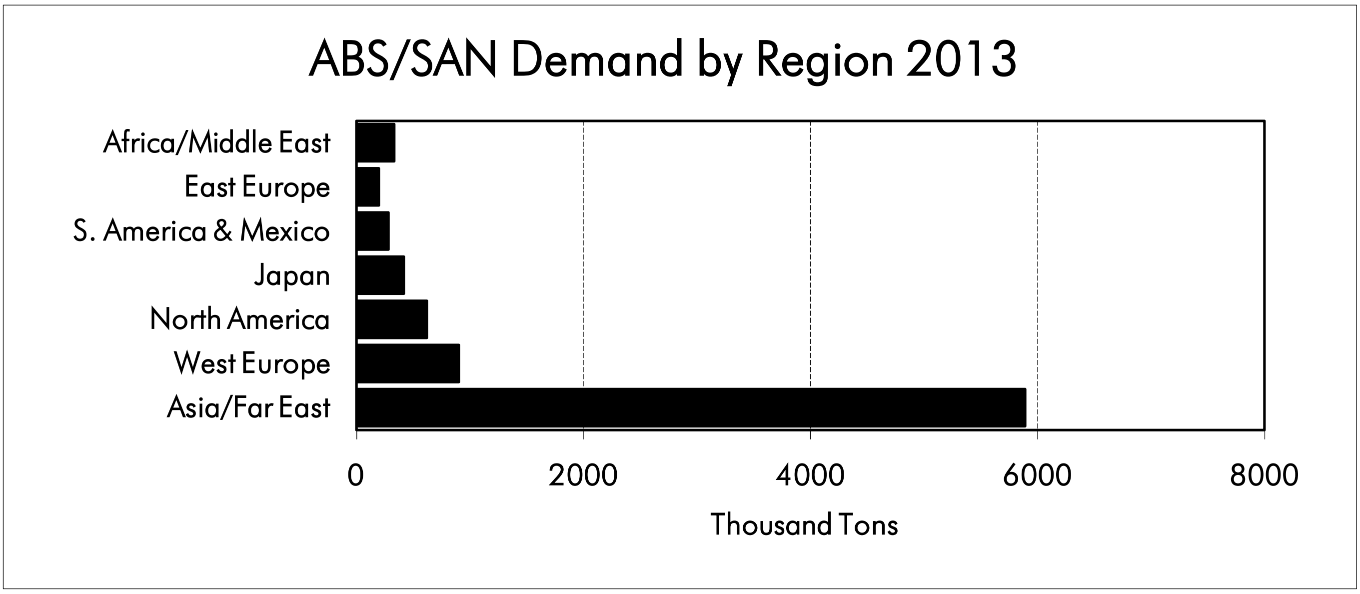

WORLD ACRYLIC FIBRE TRADE 2018
SURPLUS/(DEFICIT) BY REGION
North America
South America + Mexico
West Europe
East Europe
Africa/Middle East
Asia/Far East
Japan
-300
-200
-100
0
100
200
300
Thousand Tons


WORLD FIBRE DEMAND 2008*
Cotton
Polyester
Nylon
Cellulosic
Acrylic
Wool
Polypropylene etc.
0
10
20
30
40
50
Million Tons
*Total Market 69.6 Million Tons


WORLD FIBRE DEMAND 2013*
Cotton
Polyester
Nylon
Cellulosic
Acrylic
Wool
Polypropylene etc.
0
10
20
30
40
50
Million Tons
*Total Market 76.4 Million Tons


WORLD FIBRE DEMAND 2018*
Cotton
Polyester
Nylon
Cellulosic
Acrylic
Wool
Polypropylene etc.
0
10
20
30
40
50
Million Tons
*Total Market 88.9 Million Tons


ABS/SAN Demand by Region 2008
Africa/Middle East
East Europe
S. America & Mexico
Japan
North America
West Europe
Asia/Far East
0
2000
4000
6000
8000
Thousand Tons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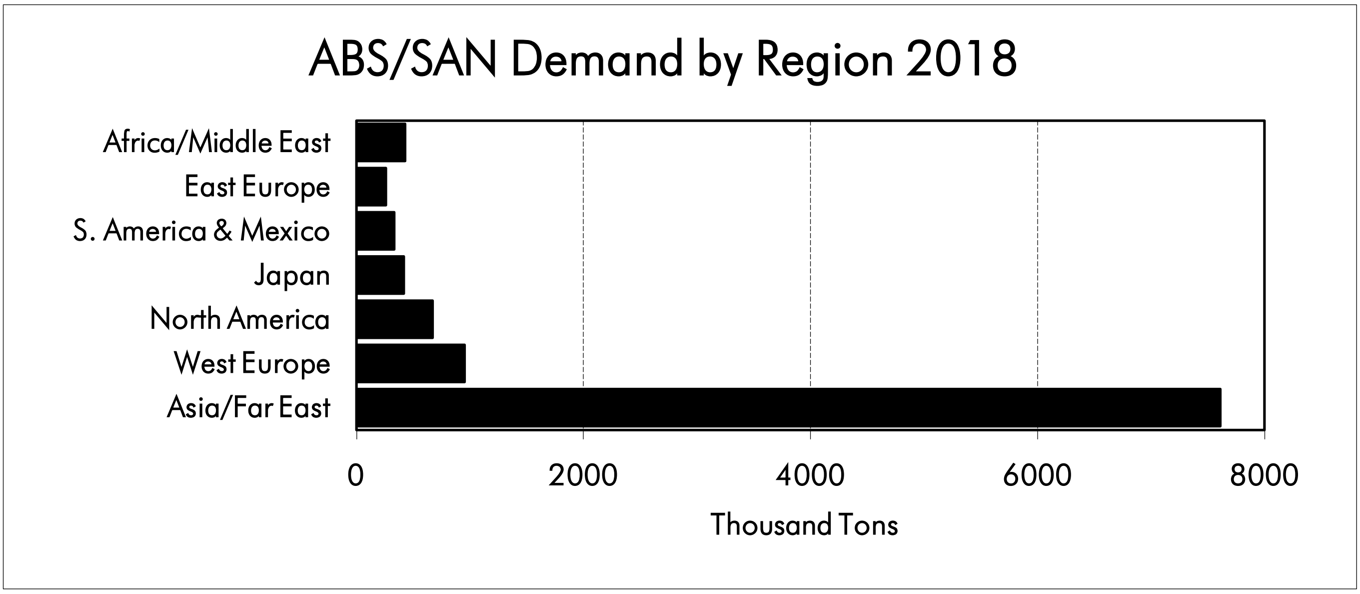
Africa/Middle East
East Europe
S. America & Mexico
Japan
North America
West Europe
Asia/Far East
0
2000
4000
6000
8000
Thousand Tons


ABS/SAN Demand by Region 2018
Africa/Middle East
East Europe
S. America & Mexico
Japan
North America
West Europe
Asia/Far East
0
2000
4000
6000
8000
Thousand Tons

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