

YELLOW **BOOK**

World PA6 & PA66

Supply / Demand Report

2016

WORLD PA6 & PA66 Supply/Demand Report 2016

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The Scenario: Yellowbook 2016

Demand

In 2016 global demand for polymer is expected to reach 5277ktes for PA6 and 2166ktes for PA66.

Demand continues to grow in both PA6 and PA66 in all 6 of the macro segments which PCI Wood Mackenzie identifies (textile filament, industrial filament, carpet filament, staple fibre, engineering plastics and film), as the industry is able to continue to find applications and uses which justify its cost.

PA6 textile filament production, which is expected to account for 36% of total PA6 polymer demand in 2016, is anticipated to continue to grow from 1885ktes in 2016 to 2202ktes in 2026 (35% of demand).

It is worth noting however that China captures almost all of the forecasted growth while other regions either shrink or grow less strongly. Similarly, industrial filament is expected to grow by a total of 172ktes over the decade 2016-2026, with 97% of this in China. It is therefore clear that although the PA6 forecast looks positive, particularly compared with PA66, in reality it relies very heavily on the sustained economic development of China and would look very different if growth in China were to stall.

Supply

On the supply side, the long-expected second wave of Chinese CPL capacity continues to be deferred. Although the medium and long term capacity projections for CPL are similar in the 2015 and 2016 editions of the Yellowbook, the near term continues to change significantly, as the timing of some specific Chinese investments is being sequenced to minimise market disruption. In the current analysis, 2017 is expected to be the year in which many of the new Chinese CPL plants reach market. In PA6 polymer, the main investment wave is still expected to be 2016.

China's drive to become self-sufficient in CPL has caused the other regions to become structurally long, and efforts continue to re-balance the individual regional markets. In North America, Fibrant announced its intention of closing its lines in Augusta, GA (250ktes/yr). According to the 2016 YB analysis, this single action will convert the USA from being a net exporter of PA6 raw materials to a net importer by the end of the decade. In Europe, BASF announced its intention to close 100ktes/yr of CPL capacity in Ludwigshafen by 2018. Although this decision will not solve Europe's over-capacity problem, it is a welcome start. The 2016YB analysis does not detail any further reductions or closures in the region, but these are to be expected.

Partially offsetting these reductions however are a number of re-starts. In South Korea, Capro Corp has restarted its #2 line (60ktes/yr), and in India FACT is currently preparing to restart its 50ktes/yr CPL line, which has been idle since 2014. In total, the global CPL operating rate is still expected to fall, from 80% in 2016 to 62% in 2020.

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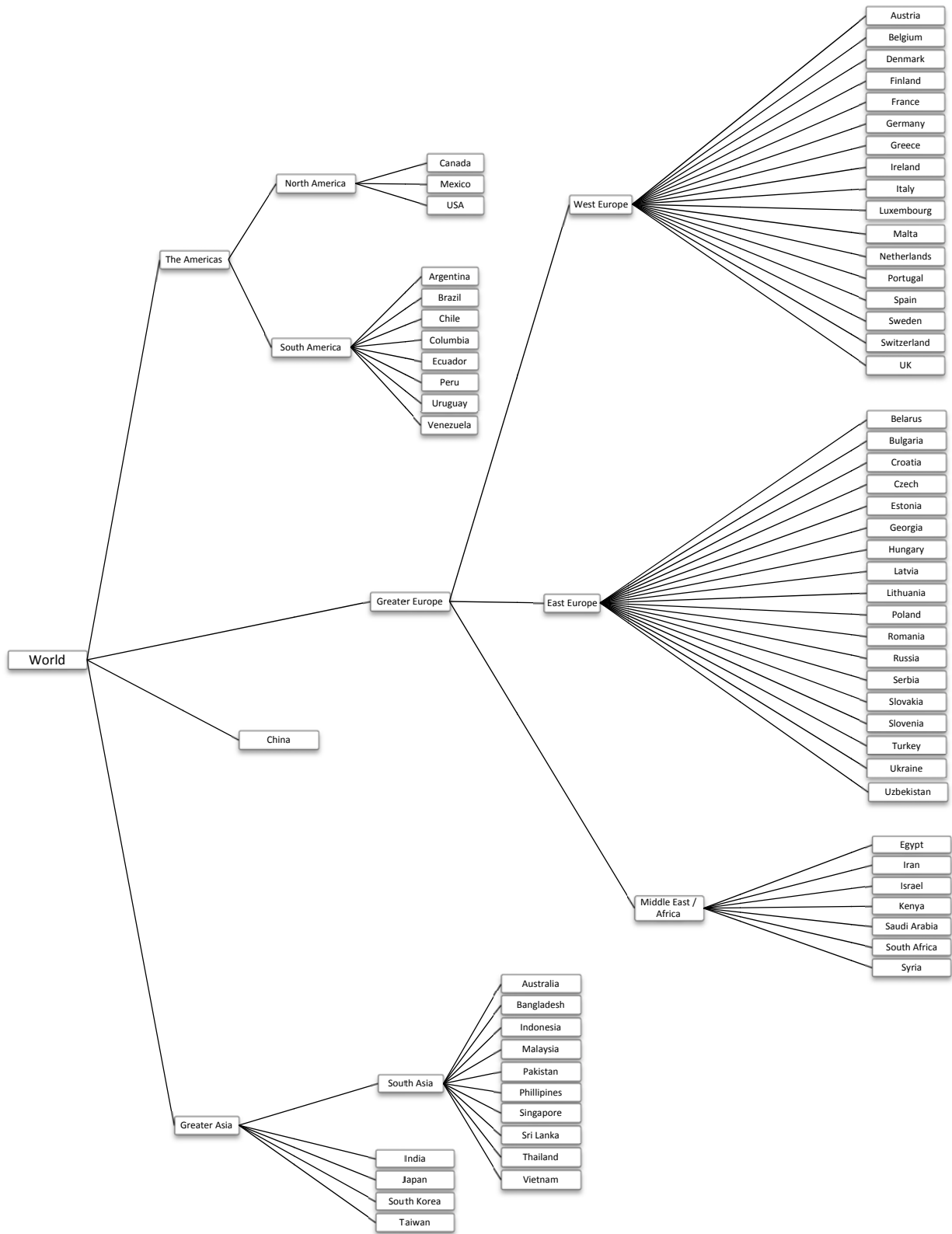
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Countries Covered



PA6 Production (ktes)

ARGENTINA

	CAGR 2016-2026	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Fibres	Textile Filament	-	6	3	4	2	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-
	Textile Capacity	0.0%	6	5	4	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Utilisation		100%	60%	100%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%
	Industrial Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Industrial Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carpet Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Filament	-	6	3	4	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-
	Total Filament Capacity	0.0%	6	5	4	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Utilisation		100%	60%	100%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%
	Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Staple Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	-	6	3	4	2	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	
Plastics	Requirement	2.8%	6	7	7	7	8	9	9	9	8	8	8	9	9	9	9	10	10	10	10	11	
	Import	-8.1%	4	4	4	4	5	6	6	6	4	5	7	3	3	3	3	3	3	3	3	3	
	Export	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Production	23.1%	2	3	3	3	3	3	3	3	5	3	1	5	6	6	6	6	7	7	7	7	
	Capacity	5.5%	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
	Utilisation		29%	43%	43%	43%	43%	43%	43%	43%	71%	43%	14%	71%	86%	86%	86%	86%	100%	100%	100%	100%	67%
Film	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Polymer	Requirement	13.2%	8	6	7	5	4	3	3	5	3	2	5	6	6	6	5	5	5	5	5	6	
	Import	12.1%	2	2	2	2	2	2	2	2	5	3	2	5	6	6	5	5	5	5	5	6	
	Export	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Production	-	6	4	5	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	
	Capacity	-	7	7	7	7	7	7	7	7	-	-	-	-	-	-	-	-	-	-	-	-	
	Utilisation		86%	57%	71%	43%	29%	14%	14%	14%	-	-	-	-	-	-	-	-	-	-	-	-	
Caprolactam	Requirement	-	6	4	5	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	
	Import	-	6	4	5	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	
	Export	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cyclohexanone	Requirement for PA6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Requirement for Other	0.0%	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Total Requirement	0.0%	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Import	0.0%	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Export	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

PA66 Production (ktes)

SPAIN

		CAGR 2016-2026	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Fibres	Textile Filament	0.0%	16	16	18	14	13	16	17	19	17	8	6	6	6	6	6	6	6	6	6	6	6	
	Textile Capacity	0.0%	20	20	20	18	19	20	21	21	22	14	11	11	11	11	11	11	11	11	11	11	11	
	Utilisation		80%	80%	90%	78%	68%	80%	81%	90%	77%	57%	55%	55%	55%	55%	55%	55%	55%	55%	55%	55%	55%	
	Industrial Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Industrial Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carpet Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Filament	0.0%	16	16	18	14	13	16	17	19	17	8	6	6	6	6	6	6	6	6	6	6	6	
	Total Filament Capacity	0.0%	20	20	20	18	19	20	21	21	22	14	11	11	11	11	11	11	11	11	11	11	11	
	Utilisation		80%	80%	90%	78%	68%	80%	81%	90%	77%	57%	55%	55%	55%	55%	55%	55%	55%	55%	55%	55%	55%	
	Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Staple Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total	0.0%	16	16	18	14	13	16	17	19	17	8	6	6	6	6	6	6	6	6	6	6	6		
Plastics	Requirement	1.3%	26	27	26	24	29	29	25	26	28	31	32	32	33	33	34	34	34	35	36	36	37	
	Import	-1.2%	12	3	8	7	6	6	7	6	7	8	9	8	8	8	8	8	8	8	8	8	8	
	Export	-6.7%	2	2	1	2	3	3	3	3	3	4	4	3	2	2	2	2	2	2	2	2	2	
	Production	1.4%	16	26	19	19	26	26	21	23	24	27	27	27	27	27	28	28	28	29	30	30	31	
	Capacity	1.2%	30	40	29	29	39	39	34	34	34	39	39	39	39	39	39	39	39	39	44	44	44	
Utilisation		53%	65%	66%	66%	67%	67%	62%	68%	71%	69%	69%	69%	69%	69%	72%	72%	72%	74%	68%	68%	70%		
Film	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Polymer	Requirement	1.1%	30	38	35	30	35	37	34	37	36	29	27	27	27	27	28	28	29	30	30	30		
	Import	-1.5%	21	39	30	26	25	41	29	33	36	35	35	31	30	30	30	30	30	30	30	30		
	Export	-3.4%	17	24	25	33	30	44	35	37	40	46	48	45	43	43	42	40	38	36	36	36		
	Production	-1.6%	26	23	30	37	40	40	41	40	40	40	40	41	40	40	40	38	36	35	36	36		
	Capacity	0.0%	40	40	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42		
Utilisation		65%	58%	75%	93%	95%	95%	95%	98%	95%	95%	95%	98%	95%	95%	95%	90%	86%	83%	86%	86%			
66 Salt	Requirement	-1.6%	30	27	35	43	47	47	47	48	47	47	47	48	47	47	47	44	42	41	42	42		
	Import	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Export	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-		
	Production	-1.6%	30	27	37	43	47	47	47	48	47	48	47	48	47	47	47	44	42	41	42	42		
	Capacity	0.0%	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50		
Utilisation		60%	54%	74%	86%	94%	94%	94%	96%	94%	96%	94%	96%	94%	94%	94%	88%	84%	82%	84%	84%			
HMD	Requirement for PA66	-1.5%	14	12	17	19	21	21	21	22	21	22	21	22	21	21	21	20	19	18	19	19		
	Requirement for Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Total Requirement	-1.5%	14	12	17	19	21	21	21	22	21	22	21	22	21	21	21	20	19	18	19			
	Import	-1.5%	14	12	17	19	21	21	21	22	21	22	21	22	21	21	21	20	19	18	19			
	Export	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
ADN	Requirement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Import	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Export	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Adipic Acid	Requirement for HMD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Requirement for PA66	-1.7%	17	15	21	24	26	26	26	27	26	27	26	27	26	26	26	25	24	23	24			
	Requirement for Other	2.0%	18	9	14	10	14	15	11	11	14	12	8	8	8	8	9	9	9	9				
	Total Requirement	-0.7%	35	24	35	34	40	41	37	38	40	39	34	35	34	34	35	34	33	32				
	Import	-1.5%	36	24	36	35	41	42	39	39	44	41	37	35	34	34	35	34	33	32				
	Export	-	1	-	1	1	1	1	2	1	4	2	3	-	-	-	-	-	-					
	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
KA OII	Requirement for AA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Import	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Export	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Utilisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						

Production Capacities: PA66 Fibres (ktes)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Wellman	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Johnsonville:SC																					
Textile Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Fibre	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monofil Producers (21)	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
various locations																					
Textile Filament	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Industrial Filament	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Fibre	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Plant Rationalisation - USA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Various																					
Textile Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South America Region	67	67	67	67	67	70	72	74	77	79	81	83	83	83	83	83	83	83	84	84	84
Textile Filament	30	30	30	30	30	33	35	36	38	40	42	44	44	44	44	44	44	44	44	44	44
Industrial Filament	35	35	35	35	35	35	35	36	37	37	37	37	37	37	37	37	37	37	38	38	38
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Fibre	67	67	67	67	67	70	72	74	77	79	81	83	83	83	83	83	83	83	84	84	84
Argentina Total	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Textile Filament	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Industrial Filament	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Fibre	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Invista Nylon (1)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Berazatequi																					
Textile Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Filament	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Fibre	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Mercedes																					
Textile Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fibercord/Kordsa (10)	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Berazatequi																					
Textile Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Filament	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Fibre	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Valenciana	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Buenos Aires																					
Textile Filament	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Industrial Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carpet Filament	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staple Fibre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Fibre	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2