



ArcelorMittal

ArcelorMittal Europe - Long Products

**Channels for the Future: UPE**

February 2016  
Central Marketing

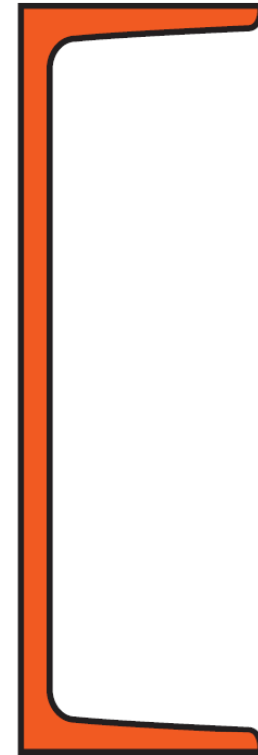
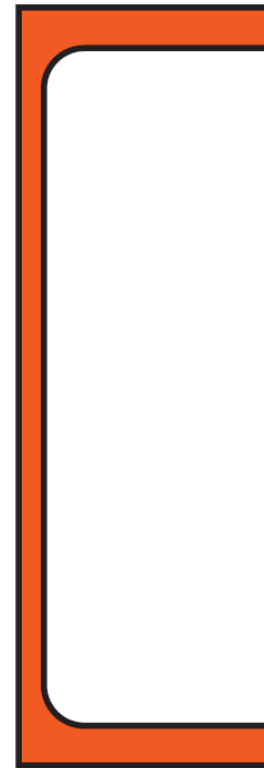
# European Channels



ArcelorMittal

New

Old



**UPE**

Channels with parallel flanges

**UPN**

Channels with tapered flanges



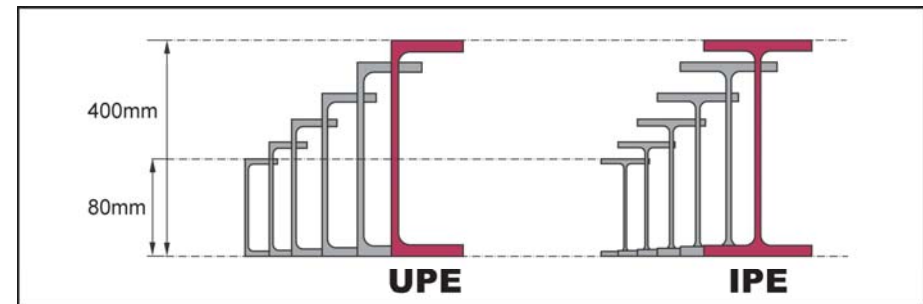
## Advantages of UPE vs UPN Channels

1. UPE matching exactly IPE size range, -- UPN not
2. UPE allow simpler connections than UPN
3. UPE weigh less than UPN
4. UPE have higher capacity and performance than UPN



# 1. Size comparison: UPN, UPE, IPE

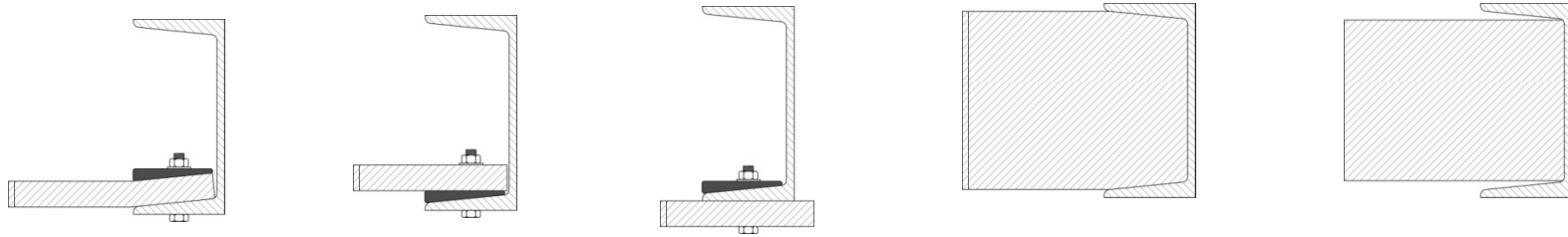
Depth (mm)	UPN	UPE	IPE
80	UPN	UPE	IPE
100	UPN	UPE	IPE
120	UPN	UPE	IPE
140	UPN	UPE	IPE
160	UPN	UPE	IPE
180	UPN	UPE	IPE
200	UPN	UPE	IPE
220	UPN	UPE	IPE
240	UPN	UPE	IPE
260	UPN		
270		UPE	IPE
280	UPN		
300	UPN	UPE	IPE
320	UPN		
330		UPE	IPE
350	UPN		
360		UPE	IPE
380	UPN		
400	UPN	UPE	IPE



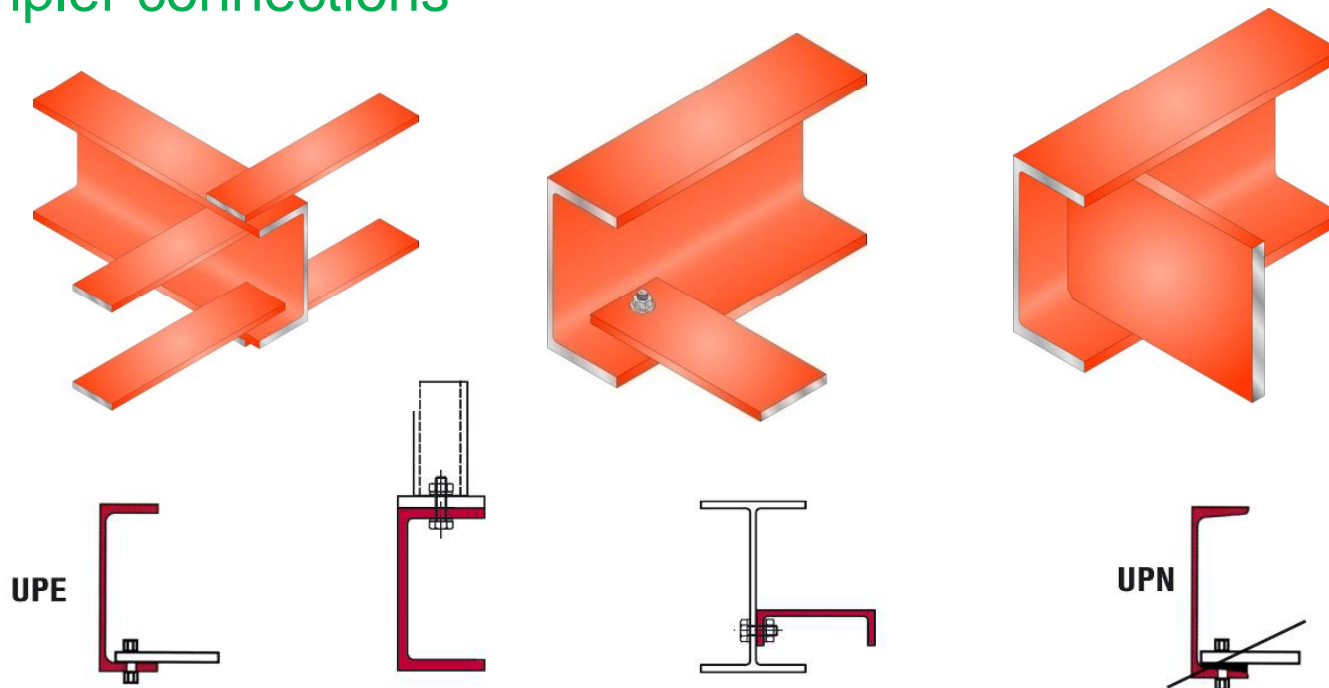
- UPN series only partially compatible with the IPE series
- ✓ UPE channel series fully compatible with IPE beams  
= sections depths are matching  
→ improved cost-efficiency

## 2. Simpler Connections, more cost-effective

UPN : complicated connections due to tapered flange thickness



UPE : simpler connections

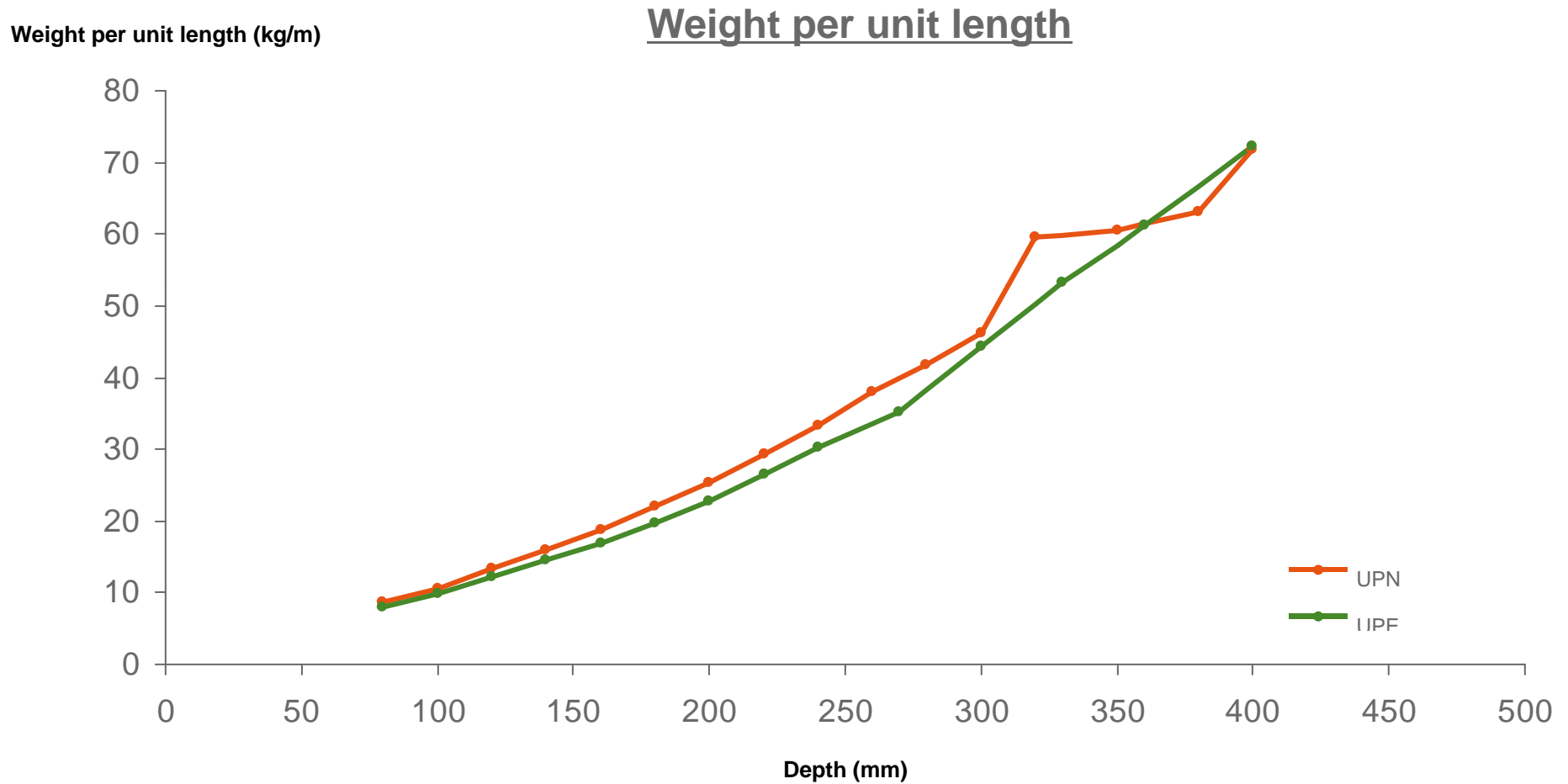


# Product range comparison UPE and UPN



Section	G	A	Wy	Wz	UPE / UPN	UPE / UPN	UPE / UPN	UPE / UPN	UPE / UPN
					Weight comparison	Section Modulus Wy comparison	Section Modulus Wz comparison	Wy/G Com Comparison	Wz/G Comparison
	kg/m	cm <sup>2</sup>	cm <sup>3</sup>	cm <sup>3</sup>	[ % ]	[ % ]	[ % ]	[ % ]	[ % ]
UPE 80	7,90	10,10	26,80	7,98	<b>-8,7</b>	<b>0,8</b>	<b>25,1</b>	<b>10,3</b>	<b>37,0</b>
UPN 80	8,65	11,02	26,60	6,38					
UPE 100	9,82	12,50	41,37	10,63	<b>-7,4</b>	<b>0,4</b>	<b>25,2</b>	<b>8,4</b>	<b>35,2</b>
UPN 100	10,60	13,50	41,20	8,49					
UPE 120	12,10	15,40	60,58	13,79	<b>-9,7</b>	<b>-0,2</b>	<b>24,2</b>	<b>10,5</b>	<b>37,6</b>
UPN 120	13,40	17,00	60,70	11,10					
UPE 140	14,50	18,40	85,64	18,19	<b>-9,4</b>	<b>-0,9</b>	<b>22,9</b>	<b>9,4</b>	<b>35,6</b>
UPN 140	16,00	20,40	86,40	14,80					
UPE 160	17,00	21,70	113,90	22,58	<b>-9,6</b>	<b>-1,8</b>	<b>23,4</b>	<b>8,6</b>	<b>36,5</b>
UPN 160	18,80	24,00	116,00	18,30					
UPE 180	19,70	25,10	150,40	28,56	<b>-10,5</b>	<b>0,3</b>	<b>27,5</b>	<b>12,0</b>	<b>42,4</b>
UPN180	22,00	28,00	150,00	22,40					
UPE 200	22,80	29,00	190,90	34,43	<b>-9,9</b>	<b>-0,1</b>	<b>27,5</b>	<b>10,9</b>	<b>41,5</b>
UPN 200	25,30	32,20	191,00	27,00					
UPE 220	26,60	33,90	243,90	42,51	<b>-9,5</b>	<b>-0,4</b>	<b>26,5</b>	<b>10,0</b>	<b>39,8</b>
UPN 220	29,40	37,40	245,00	33,60					
UPE 240	30,20	38,50	299,90	50,08	<b>-9,0</b>	<b>0,0</b>	<b>26,5</b>	<b>9,9</b>	<b>39,0</b>
UPN 240	33,20	42,30	300,00	39,60					
UPE 270	35,20	44,80	389,20	60,69	<b>-7,1</b>	<b>4,9</b>	<b>27,2</b>	<b>13,0</b>	<b>37,0</b>
UPN 260	37,90	48,30	371,00	47,70					
UPN 280	41,80	63,30	448,00	57,20					
UPE 300	44,40	56,60	521,50	75,58	<b>-3,9</b>	<b>-2,5</b>	<b>11,5</b>	<b>1,4</b>	<b>16,0</b>
UPN 300	46,20	58,80	535,00	67,80					
UPE 330	53,20	67,80	667,10	89,66	<b>-10,6</b>	<b>-1,8</b>	<b>11,2</b>	<b>9,9</b>	<b>24,4</b>
UPN 320	59,50	75,80	679,00	80,60					
UPN 350	60,60	77,30	734,00	75,00					
UPE 360	61,20	77,90	823,60	105,10	<b>-3,0</b>	<b>-0,7</b>	<b>33,5</b>	<b>2,4</b>	<b>37,7</b>
UPN 380	63,10	80,40	829,00	78,70					
UPE 400	72,20	91,90	1049,00	122,60	<b>0,6</b>	<b>2,8</b>	<b>20,2</b>	<b>2,3</b>	<b>19,5</b>
UPN 400	71,80	91,50	1020,00	102,00					

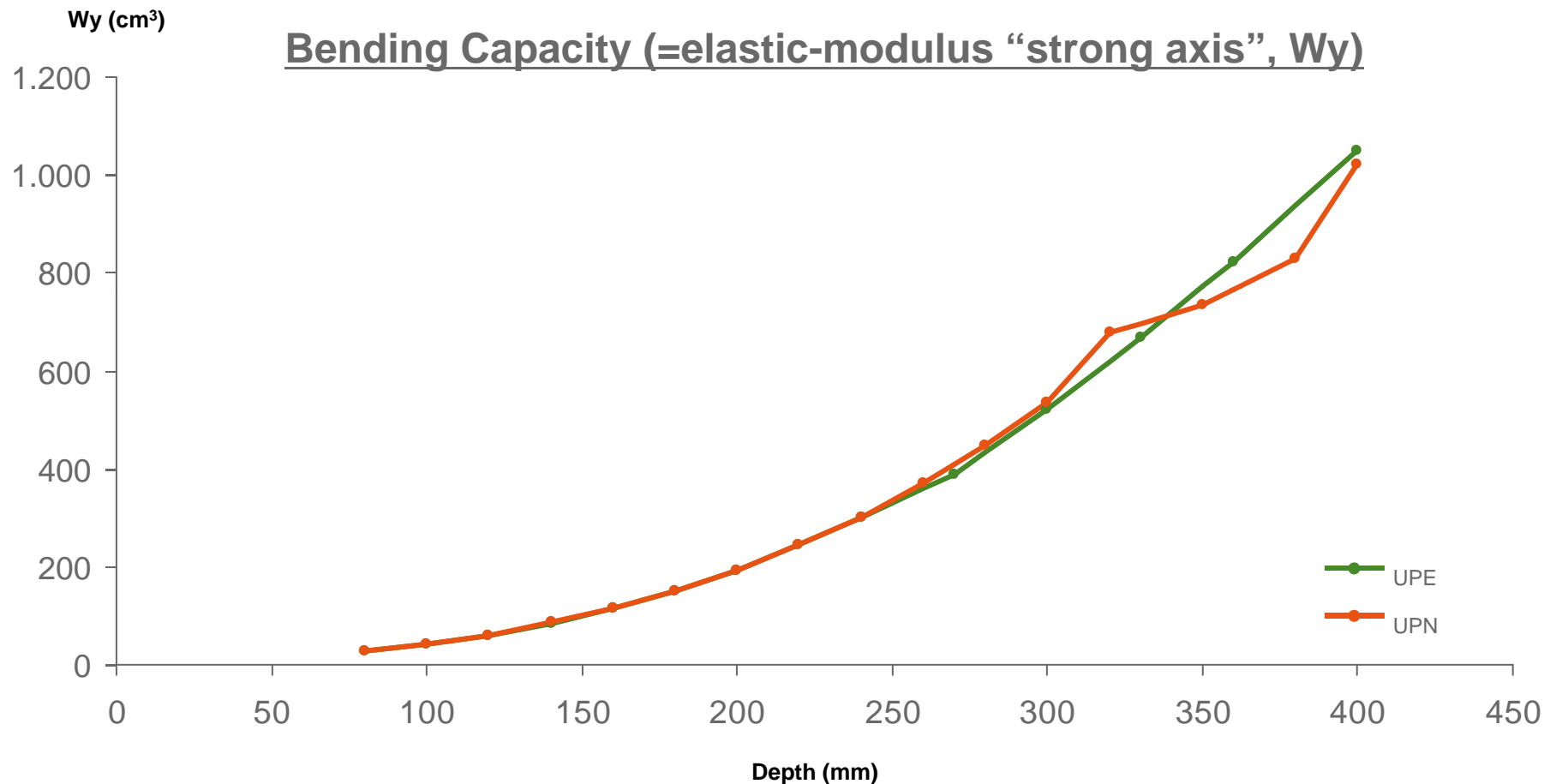
### 3. UPE are lighter, so more cost competitive



Due to their thinner web and flanges, UPE channels are lighter than UPN channels (about 8%, up to 10%)



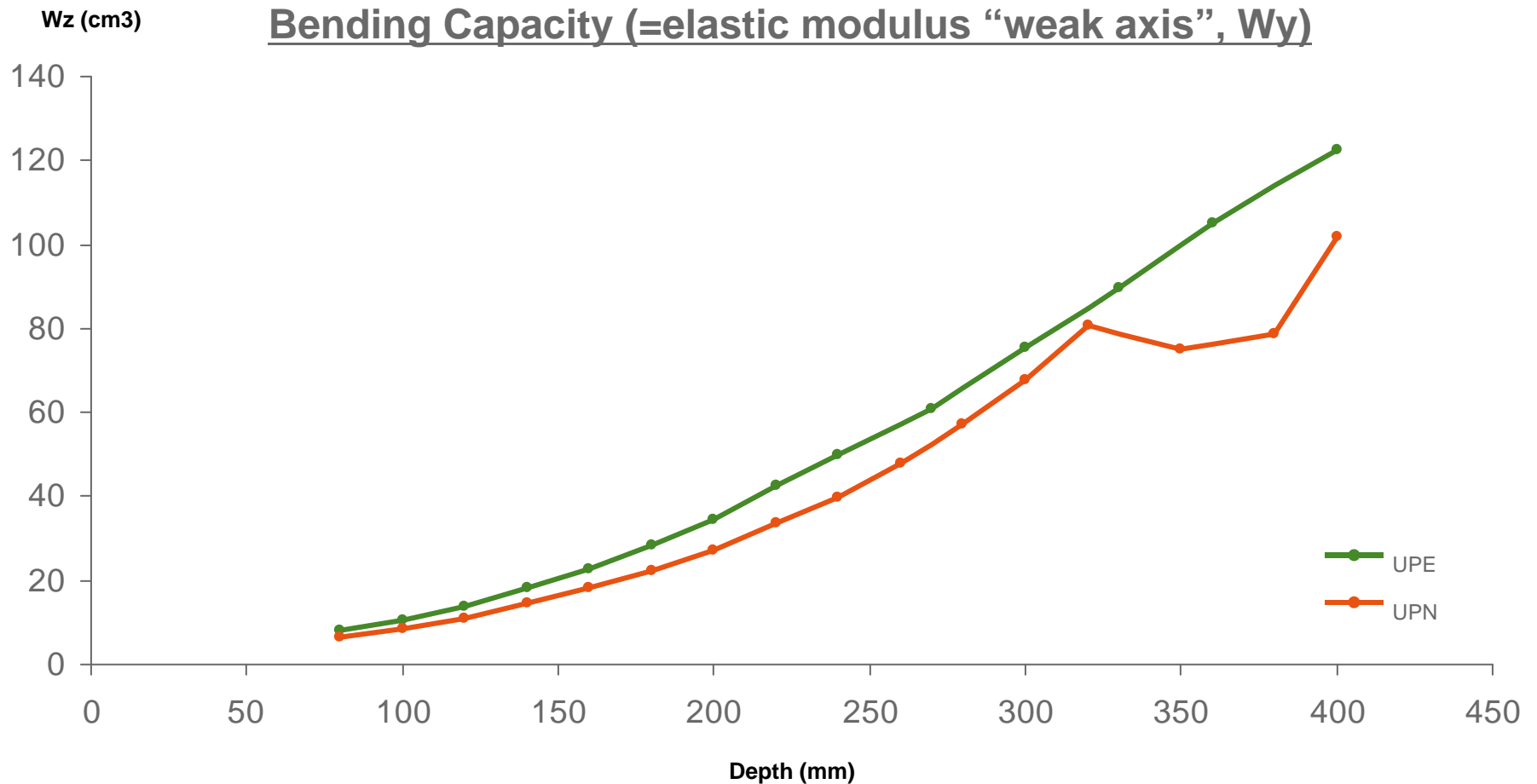
## 4. UPE and UPN have comparable bending capacity in the “strong axis”



Despite their lighter weight, the capacity “strong axis” of UPE channels are comparable to those of UPN channels



## 4. UPE has better bending capacity in the weak axis” compared to UPN



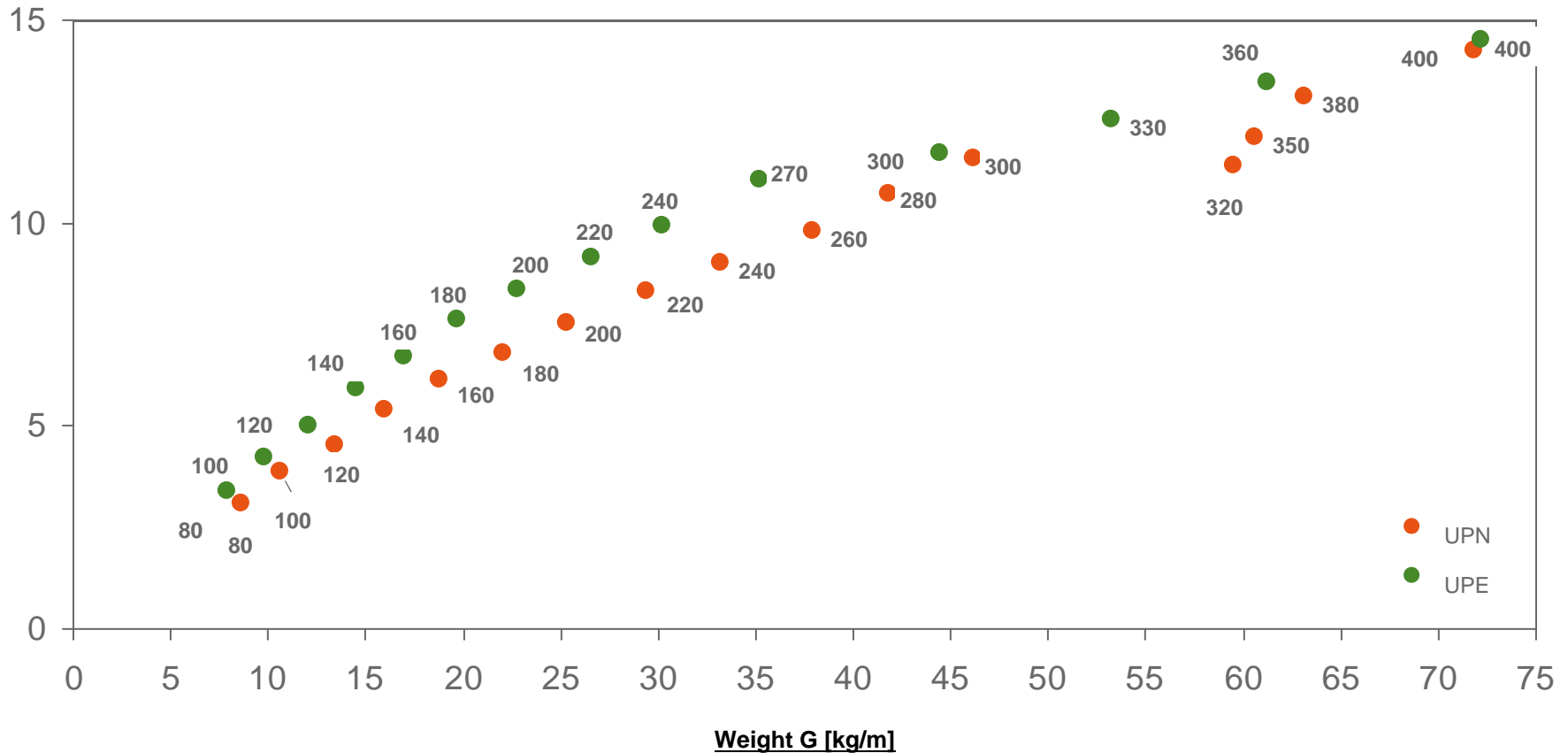
Despite their lighter weight, the capacity “weak axis” of UPE are higher than of UPN (on average 25 % and up to 30%)

# 4. UPE have higher efficiency than UPN



Specific Capacity (= ratio of elastic modulus “strong axis” to unit weight)

Ratio Wy/G [cm<sup>3</sup>m/Kg]



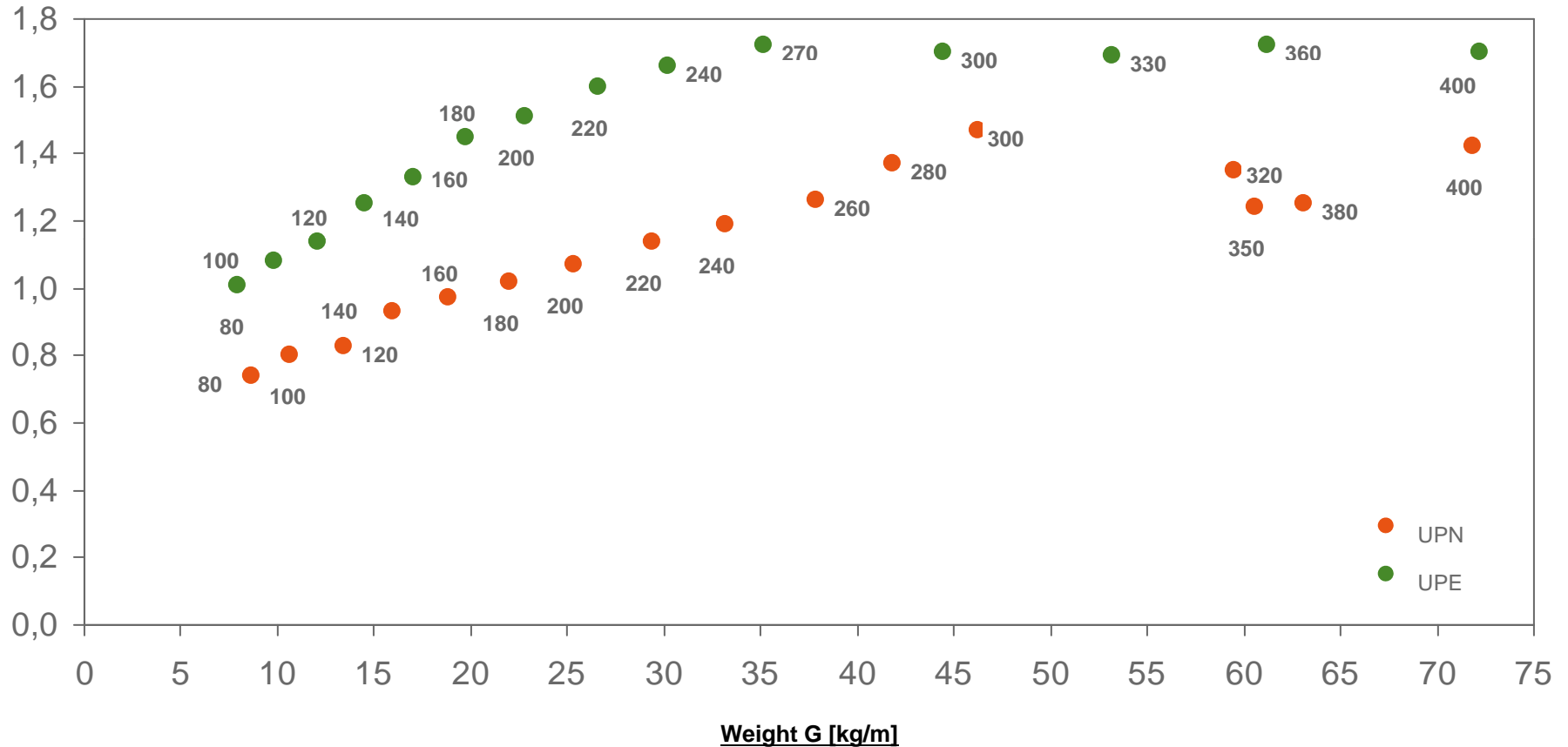
For UPE channels the specific capacity “strong axis” are on average 10% and up to 12% higher than of UPN channels

# 4. UPE have higher efficiency than UPN



Specific Capacity (= ratio of elastic modulus “weak axis” to unit weight)

Ratio Wz/G [cm<sup>3</sup>m/Kg]



For UPE channels the specific capacity “weak axis” are on average 35% and up to 42% higher than of UPN channels



## Conclusions

- 100% compatible size range: Depths of UPE channels fully match those of IPE beams: → improved cost-efficiency
- Connections of UPE are simpler and more cost-efficient than for UPN channels because of no tapered flange thickness
- Weight saving: UPE are on average 8 % lighter than UPN
- Higher bending capacity and efficiency:
  - Comparable capacity in “strong axis” but higher capacity in “weak axis” (average: 25%)
  - Efficiency: specific capacity (W/G) is higher: average 10% (“strong axis”) and 35% (“weak axis”)

Thank You!



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