## **Progressive Addition Lenses - Measurements and Ratings**

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Data based upon the following publication: Sheedy JE, Hardy RF, Hayes JR. Progressive addition lenses - measurements and ratings. Optometry 2006;77:23-39.

Table 1. Criteria for calculating ratings from measured values

Rating Category	<b>Derivative Measures</b>	0-100 scale
	50% - width at fitting cross	5-20 mm
Distance Zone	50% - area from 1.5 mm above fitting cross	15-60 mm <sup>2</sup>
	50% - width at 1.25 D add	2-5 mm
Intermediate Zone	50% - area from 0.75 to 1.50 add	10-30 mm <sup>2</sup>
Near Zone*	50% - width at Y	0-15 mm
Near Zone	50% - area to Y +0.5 mm	0 - 100 mm <sup>2</sup>
Astigmatism	Largest magnitude	2.75 - 1.25 D

<sup>\*</sup> Near zone ratings reported for a specified fitting height. Fitting height determined by adding 2 mm to the Y value

Tables 2-4 rate the lenses along a single attribute. You would use these table ONLY for those patients for whom there is a single over-riding need. For example, the distance rankings (Table 2) would be used for patients who drive a lot or are involved in outdoor work and have only occasional need for intermediate and near vision. The intermediate rankings would be used for patients who want a general purpose PAL but whose primary need is viewing a computer or performing a manufacturing task at intermediate viewing distances. Such patients, however, would likely benefit from an occupational progressive lens. The rankings based upon astigmatism would be used for those patients who are very sensitive to unwanted astigmatism and for whom this is the most important lens attribute.

Table 2. Ratings for distance and intermediate viewing zones. Columns of dots indicate values that are not statistically different from one another. Highest and lowest rated designs, determined as explained in the text, are in **bold**.

			;	Si	ng	gl	е	Α	tt	ri	bute Ratings												
Dista	ance	Ratir	าดู	J							Interr	media	ate	R	at	tir	าดู	3					
PAL Design	Mean	SD	R	s	ige igr iffe	ìif	ica	an	t	1-	PAL Design	Mean	SD		F	;	si	ge: gn ffe	ifi	Cá	ant	t	-
Shamir Genesis	77.8		•								Pentx AF	100.4											
Vis Ease Outlk	70.7	13.8	•	•							Pentx AF Mini	79.1	7.4		•								
Rdnstk Life AT poly	67.5	17.7	•	•							Zei Gradal Brevity	70.3	12.9	)	•	•							
Younger Image	57.5	15.5		•							Zei Gradal Top	66.6	8.5		•	•	•						
Zei Gradal Top	57.2	11.8		•	•						Sig Kodak	61.1	7.0			•	•	•					
Sig Kodak	45.9	14.1		•	•						SolaMax	60.6	3.6			•	•	•					
Sig Kod Precise	42.1	13.3		•	•	•					Varlx Liberty	59.9	13.0	)		•	•	•					
Varlx Comfort	39.0	14.9			•	•	•				Varlx Panamic	56.1	6.0			•	•	•	•				
Varlx Liberty	34.8	10.5			•	•	•	•			Rdnstk Life AT poly	56.0	13.8	3		•	•	•	•				
Vis Ease Illumina	34.2	18.3			•	•	•	•			Younger Image	55.7	12.4	Ļ		•	•	•	•				
Varlx Panamic	32.5	7.7			•			•			SOLA One	53.8	6.2				•	•	•	•			
Zei Gradal Brevity	30.2	13.7			•	•	•	•	•		AO Easy	49.1	5.5					•	•	•	•		
AO Easy	27.1	6.6				•	•	• •	•		Varlx Comfort	47.3	8.1					•	•	•	•		
Rdnstk Life XS	26.9	11.7				•	•	• •	•		Shamir Genesis	45.9	2.9					•	•	•	•		
Varlx Ellipse	25.2	6.2				•	•	•	•		Sig Kod Precise	42.5	7.6					•	•	•	•	•	
AO Compact	21.0	12.7					•	•	•		Vis Ease Outlk	42.2	4.2					•	•	•	•	•	
Sig Kod Concise	20.5	11.3					•	•	•		Shamir Piccolo	38.7	3.2						•	•	•	•	•
SolaMax	19.0	11.0						• •	•		Vis Ease Illumina	34.6	12.5	_					I	•	•	•	•
SOLA One	18.2	5.9		floor				• •	•		Sig Nav Short	32.3	19.7	_							•	•	• •
Sig Nav Short	15.5	15.5						•	•		AO Compact	27.0	5.4									•	• •
Shamir Piccolo	13.5	7.4							•		Sig Kod Concise	26.9	3.7						I			•	•
Pentx AF	-4.2	19.7								•	Rdnstk Life XS	26.4	7.5										•
Pentx AF Mini	-4.6	17.7								•	Varlx Ellipse	22.8	4.3										•
Mean	33.8	25.7									Mean	50.3	21.4	Ļ									

Tables 3 and 4 rate the lenses along a single attribute related to the near viewing zone. You would use these tables ONLY for those patients for whom near vision is the single over-riding need. This would apply to patients who perform extensive near tasks yet also desire a general purpose PAL. This also applies to patients who intend to use the lenses primarily as reading glasses but also desire a general purpose PAL. An OPL should be considered for some of these patients.

Because the near characteristics are dependent upon the fitting height, ratings are presented separately for fitting heights of 16, 18, and 22. The rankings are directly related to the width and area of the near viewing zone. As result, the ratings generally increase with greater fitting height – because a greater fitting height necessarily results in a larger near viewing zone for all lenses. The larger ratings for greater fitting heights represent the fact that the patient will have a larger and wider near viewing zone with a greater fitting height. Only a few lenses provide any near addition for a fitting height of 16 mm. Note also that the rankings change somewhat as a function of the fitting height. This is because manner in which the near zone changes towards the bottom of the lens is different for the various lenses

Table 3. Ratings for near viewing zones - fitting heights of 16 and 18. Columns of dots indicate values that are not statistically different from one another. Highest and lowest rated designs, determined as explained in the text, are in **bold**.

				S	ir	าด	ıle	•	Αt	tr	ibute Ratings												_
				_							ne Rating												_
Fitt	ing He	ight '	16									itting l	Heig	ht	18	8						_	_
PAL Design	Mean	SD		Rai	ng ig	ni	fic	ar		า-	PAL Design	Mean				Rai	sig	ni	fic	f n an ce	t	-	
Shamir Piccolo	33.7	2.1	•								Shamir Piccolo	50.1	2.5	•									
Sig Kod Concise	31.6	2.7	•								Sig Kod Concise	48.5											
Rdnstk Life XS	30.0	1.5	•	•							Sig Nav Short		10.0										_
Varilux Ellipse	29.1	1.8	•	•							AO Compact	45.1	4.5	•	•	•							
AO Compact	29.0	3.4	•	•							Rdnstk Life XS	43.7			•	•	•						
Sig Nav Short	28.7	12.7	•	•							Varlx Ellipse	40.0	_		•	•	•	•					
Vis Ease Illumina	22.8	4.7		•	•						Vis Ease Illumina	38.3	3.6			•	•	•					
SolaMax	19.3	4.5			•	•					SolaMax	38.2				•	•	•	•				
AO Easy	18.4	4.4			•	•	•				SOLA One	34.8					•	•	•	•			
Pentax AF Mini	18.1	7.2			•	•	•				Younger Image	32.7	4.9					•	•	•	•		
SOLA One	17.7	4.1			•	•	•				AO Easy	32.5						•	•	•			
Vis Ease Outlk	17.3	3.2			•	•	•				Vis Ease Outlk	32.3						•	•	•	•		
Sig Kod Precise	16.7	4.0			•	•	•	•			Pentx AF Mini	31.9						•	•	•	•		
Younger Image	16.1	6.9			•	•	•	•			Sig Kod Precise	31.5						•	•	•	•		
Pentax AF	11.3	10.5				•	•	•	•		Sig Kodak	28.6							•	•	•		
Varilux Comfort	10.1	6.9					•	1 -			Shamir Genesis	27.8								•	•		
Varilux Liberty	10.0	7.2					•	•	•		Varlx Comfort	27.4								•	•		
Rdnstk Life AT poly		6.1						•	•		Rdnstk Life AT poly									•	•		
Shamir Genesis	8.6	5.1						•	•		Varlx Panamic	27.1								•	•	•	
Varilux Panamic	8.3	6.0						•	•		Varlx Liberty	26.2	9.3							•	•	•	
Sig Kodak	7.5	8.1							•		Pentx AF		15.2								•	•	•
Zei Gradal Brevity	6.5	9.5							•	•	Zei Gradal Brevity	17.3	15.9									•	•
Zei Gradal Top	0.0	0.0								•	Zei Gradal Top	15.3	8.5										•
Mean	17.4	11.0									Mean	33.3	11.5								ıĪ		

The ratings for astigmatism are directly related to the magnitude of the unwanted astigmatism. Lenses with higher ratings have less unwanted astigmatism and therefore fewer distortions in the field. Lenses with higher astigmatism ratings should be used for patients who are particularly sensitive to lens adaptation problems.

Table 4. Ratings for unwanted astigmatism and for near zone - fitting height of 22. Columns of dots indicate values that are not statistically different from one another. Highest and lowest rated designs, determined as explained in the text, are in **bold**.

			,	Siı	ng	gl	е	Δ	١t١	tri	ib	ute Ratings										
Astigi	matis	m ra			_						T	Rating	Fit F	leig	h	t :	22	2				
PAL Design	Mean	SD		an s	ig ig	es ni er	fic	ca	nt		-	PAL Design	Mean		_	Ra	in si	ge gr	if	of ica no	nt	
Varlx Panamic	73.9	2.3	•									Shamir Piccolo	79.9	2.1	•							
AO Easy	67.9	2.5	•	•								AO Compact	72.7	6.5	•	•						
Zei Gradal Brevity	67.7	4.0	•	•								Sig Nav Short	70.7	6.6	•	•	•					
AO Compact	67.4	4.0	•	•								SolaMax	70.4	3.9	•	•	•					
SOLA One	66.6	3.1	•	•								Rdnstk Life XS	70.1	2.5	•	•	•	•				
Pentx AF Mini	64.2	4.4		•	•						-	Sig Kod Concise	68.0	6.8	•	•	•	•	•			
Vis Ease Illumina	64.0	7.6		•	•						٦	Vis Ease Illumina	67.1	2.9	•	•	•	•	•			
Shamir Piccolo	57.9	2.1		-	•	•						SOLA One	61.7	5.6		•	•	•	•	•		
Sig Kod Precise	56.3	4.8				•					T	Younger Image	61.3	7.3		•	•	•	•	•		
SolaMax	56.1	2.8				•						Rdnstk Life AT poly	60.7	4.2		•	•	•	•	•		
Pentx AF	55.3	20.0				•	•					Sig Kod Precise	59.2	3.4		•	•	•	•	•		
Shamir Genesis	55.3	3.2				•	•					Varilux Ellipse	58.1	3.7			•	•	•	•		
Varlx Ellipse	54.6	4.5				•	•	•				AO Easy	57.8	6.0			•	•	•	•		
Younger Image	52.3	3.1				•	•	•			1	Varilux Comfort	56.7	8.5				•	•	•	•	
Varlx Liberty	51.1	3.3				•	•	•	•		1	Vis Ease Outlk	55.8	5.7					•	•	•	•
Sig Kod Concise	51.0	3.5				•	•	•	•		-	Sig Kodak	55.7	8.6					•	•	•	•
Zei Gradal Top	47.5	2.7				•	•	•	•	•		Pentax AF Mini	55.7	4.7					•	•	•	•
Sig Kodak	46.9	3.1						•	•	•		Shamir Genesis	55.4	4.8					•	•	•	•
Rdnstk Life XS	46.6	3.2						•	•	•	T	Varilux Liberty	53.1	12.0						•	•	•
Sig Nav Short	46.3	10.9					,	•	•	•	Ī	Varilux Panamic	52.0	5.6						•	•	•
Vis Ease Outlk	43.5	2.4							•	•		Zei Gradal Top	43.8	8.5							•	• •
Varlx Comfort	42.7	6.3								•		Pentax AF	42.7	23.3								• •
Rdnstk Life AT poly	19.4	4.5									•	Zei Gradal Brevity	32.7	28.8								•
Mean	54.5	12.8									T	Mean	59.2	14.0								

The ratings in Tables 5 and 6 are based upon equal weightings of the distance and intermediate ratings and the intermediate and near (fitting height of 22 mm) ratings respectively. The ratings on the left do not consider the amount of unwanted astigmatism, whereas those on the right hand side include a 25% weighting of astigmatism.

The distance/intermediate ratings in Table 5 apply to patients with primary visual needs at those 2 distances and for whom near viewing is not as important. This could apply to drivers or those with outdoor occupations and recreations who have intermediate viewing needs but for whom near viewing is not as important. The ratings that include astigmatism weighting apply to patients with sensitivity to unwanted astigmatism.

**Table 5**. Distance oriented visual usage, based upon combined ratings for distance and intermediate zones. Ratings with and without weighting for astigmatism rating. Columns of dots indicate values that are not statistically different from one another. Highest and lowest rated designs, determined as explained in the text, are in **bold**.

	D	istan	IC	е	ar	nd		nt	eı	rn	nediate Combine	ed								
Withou	ıt Asti	gmat	tis	m	1						With A	Astig	mati	SI	n					
PAL Design	Mean	SD		Rai		ni	fic	an		1-	PAL Design	Mean			Rai s	sig	ni	fic	no an	
Rdnstk Life AT poly	62.8	9.6	•								Shamir Genesis	60.2	4.5	•						
Shamir Genesis	61.9	6.3	•								Zei Gradal Top	58.3	5.5	•						T
Zei Gradal Top	61.9	6.8	•								Zei Gradal Brevity	56.4	13.5	•	•					
Younger Image	56.6	8.7	•	•							Younger Image	55.5	6.9	•	•					
Vis Ease Outlk	56.4	6.3	•	•							Vis Ease Outlk	53.2	4.8	•	•	•				T
Sig Kodak	53.5	8.1	•	•	•						Rdnstk Life AT poly	52.0	7.1	•	•	•	•			
Zei Gradal Brevity	52.7	17.4	•	•	•	•					Sig Kodak	51.9	6.2	•	•	•	•			
Pentax AF	50.3	24.8	•	•	•	•	•				Varilux Panamic	51.7	4.3	•	•	•	•			
Varilux Liberty	47.4	5.9		•	•	•	•	•			Pentax AF	51.6	15.3	•	•	•	•			
Varilux Panamic	44.3	5.9		•	•	•	•	•			Varilux Liberty	48.3	4.5		•	•	•	•		
Varilux Comfort	43.2	9.9		•	•	•	•	•			Sig Kod Precise	45.8	5.0			•	•	•		
Sig Kod Precise	42.3	6.2			•	•	•	•			AO Easy	45.5	2.7			•	•	•		
SolaMax	39.8	5.1				•	•	•			Pentax AF Mini	44.0	6.9			•	•	•	•	
AO Easy	38.1	3.3					•	•	•		SolaMax	43.8	3.6			•	•	•	•	
Pentax AF Mini	37.3	8.5					•	•	•	•	SOLA One	43.6	3.5			•	•	•	•	
SOLA One	36.0	4.2						•	•	•	Varilux Comfort	43.0	7.9				•	•	•	
Vis Ease Illumina	34.4	13.8						•	-	•	Vis Ease Illumina	41.8	8.7					•	•	•
Rdnstk Life XS	26.6	8.7							•	•	AO Compact	34.8	6.3						•	• •
Shamir Piccolo	26.1	3.6							•	•	Shamir Piccolo	34.1	2.8							• •
AO Compact	24.0	7.5								•	Varilux Ellipse	31.7	3.3							•
Varilux Ellipse	24.0	3.5								•	Rdnstk Life XS	31.6	6.5							•
Sig Nav Short	23.9	15.5								•	Sig Kod Concise	30.5	5.2							•
Sig Kod Concise	23.7	6.3								•	Sig Nav Short	29.5	9.4							•
Mean	42.0	16.1									Mean	45.2	11.4							

The intermediate and near category in Table 6 applies to patients who largely work indoors and primarily perform visual tasks at those viewing distances and for whom distance vision is not as important. The ratings that include astigmatism weighting apply to patients with sensitivity to unwanted astigmatism.

**Table 6.** Near oriented visual usage, based upon combined ratings for intermediate and near (FH 22) zones. Ratings with and without weighting for astigmatism rating. Columns of dots indicate values that are not statistically different from one another. Highest and lowest rated designs, determined as explained in the text, are in **bold**.

	N	leai	r (	FI	Н	2	2)	) a	31	าด	I Intermediate C	ombir	ned											
Withou	t Asti	igm	a	tis	sn	n					Wit	h Ast	igma	at	is	m	1							
PAL Design	Mean			s d	ig	es ni er	fic	a	nt		PAL Design	Mean	SD				si	gn	ifi	са	no int		-	
Pentax AF	71.4	14.6									Pentax AF	67.4	8.8	•										
Pentax AF Mini	67.4	3.1									Pentax AF Mini	66.6	2.7	•										
SolaMax	65.5	2.9	•	•							SolaMax	63.1	2.1	•	•						Ц			
Shamir Piccolo	59.3	1.5		•	•						SOLA One	60.0	2.4		•	•								
Younger Image	58.5	4.3		•	•	•					Shamir Piccolo	59.0	1.4		•	•	•							
Rdnstk Life AT poly	58.4	6.4		•	•		•				Varilux Panamic	59.0	2.7		•	•	•							
Sig Kodak	58.4	3.8		•	•	•	•				Zei Gradal Brevity	57.4	9.5			•	•	•						
SOLA One	57.7	2.7			•	•	•				AO Easy	57.1	2.0			•	•	•						
Varilux Liberty	56.5	4.2			•	•	•	•			Younger Image	57.0	3.8			•	•	•	•					
Zei Gradal Top	55.2	3.9			•	•	•	•	•	•	Sig Kodak	55.5	3.0			•	•	•	•					
Varilux Panamic	54.0	3.7			•	•	•	•	Ť	•	Varilux Liberty	55.2	3.1			•	•	•	•	•				
Zei Gradal Brevity	53.9	12.1			•	•	•	•	Ť	•	Vis Ease Illumina	54.2	3.2				•	•	•	•	•			
AO Easy	53.4	2.6			•	•	•	•	•	•	AO Compact	54.2	1.4				•	•	•	•	•			
Varilux Comfort	52.0	3.3			•	•	•	•	•	•	Zei Gradal Top	53.3	3.2					•	•	•	•	•		Г
Sig Nav Short	51.5	7.6				•	•	•	•	•	Sig Kod Precise	52.2	3.3					•	•	•	•	•	•	Г
Sig Kod Precise	50.9	4.3				•	•	•	•	•	Shamir Genesis	51.8	1.5						•	•	•	•	•	Г
Vis Ease Illumina	50.9	6.0				•	•	•	•	•	Sig Nav Short	50.2	3.5							•	•	•	•	Г
Shamir Genesis	50.6	2.3					•	•	•	•	Varilux Comfort	49.7	2.5								•	•	•	Г
AO Compact	49.8	2.1						•	•	•	Rdnstk Life AT poly	48.6	4.1									•	•	•
Vis Ease Outlk	49.0	2.3						•	•	•	Sig Kod Concise	48.3	2.6									•	•	•
Rdnstk Life XS	48.2	3.3							•	•	Rdnstk Life XS	47.8	2.8										•	•
Sig Kod Concise	47.5	3.6							•	•	Vis Ease Outlk	47.6	1.7										•	•
Varilux Ellipse	40.4	2.9								•	Varilux Ellipse	44.0	2.9											•
Mean	54.8	8.6									Mean	54.7	7.0											

The ratings in Table 7 combine the ratings for distance, intermediate and near viewing zones or the distance and near zones. These ratings apply for general usage needs. The ratings based upon all three zones apply for patients with general viewing needs at all 3 distances. The ratings that include astigmatism weighting apply to patients with sensitivity to unwanted astigmatism.

**Table 7.** General vision usage category, using combined ratings for distance, intermediate and near (FH 18) zones. Ratings with and without weighting for astigmatism rating. Columns of dots indicate values that are not statistically different from one another. Highest and lowest rated designs, determined as explained in the text, are in **bold**.

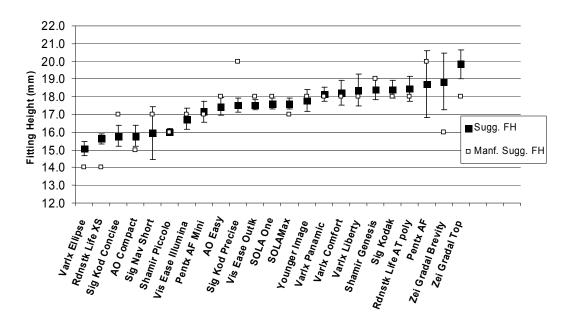
Dis	tance,	Inte	m	1e	di	at	е	ar	nd	Near (FH 18) C	ombir	ned						
Withou	ıt Astiç	mat	is	m						With A	Astign	nati	sn	n				
PAL Design	Mean	SD	_	an si	ge ign	ifi	са	nt		PAL Design	Mean	SD	Ra	ang sig	gni	fica	no ant	
Rdnstk Life AT poly	50.9	5.7	•							Shamir Genesis	51.7	3.5	•					
Shamir Genesis	50.5	5.0	•							Younger Image	49.6	4.1	•	•				
Younger Image	48.6	5.0	•							Zei Gradal Brevity	47.6	6.5	•	•	•			<u> </u>
Vis Ease Outlk	48.4	4.2	•							Varilux Panamic	47.4	2.5	•	•	•			
Zei Gradal Top	46.4	3.3	•	•						Vis Ease Outlk	47.2	3.2	•	•	•			
Sig Kodak	45.2	4.1	•	•	•					Zei Gradal Top	46.6	2.7		•	•			
Pentax AF	41.4	11.9		•	•	•				Sig Kodak	45.6	3.0		•	•			
Zei Gradal Brevity	40.9	8.0		•	•	•				Pentax AF	44.9	6.1		•	•	•		
Varilux Liberty	40.3	3.5		•	•	•				AO Easy	44.2	1.7			•	•	•	
SolaMax	39.2	3.0			•	•	•			SolaMax	43.4	2.0			•	•	•	
Sig Kod Precise	38.7	4.0			•	•	•			SOLA One	43.3	2.0			•	•	•	
Varilux Panamic	38.6	3.5			•	•	•			Rdnstk Life AT poly	43.1	4.4			•	•	•	
Varilux Comfort	37.9	6.2				•	•	•		Sig Kod Precise	43.1	3.3			•	•	•	
AO Easy	36.2	2.0				•	•	•	•	Varilux Liberty	43.0	2.3			•	•	•	
Vis Ease Illumina	35.7	8.2				•	•	•	•	Vis Ease Illumina	42.8	4.5			•	•	•	
SOLA One	35.6	2.2				•	•	•	•	Pentax AF Mini	42.6	4.0			•	•	•	
Pentax AF Mini	35.5	4.7				•	•	•	•	Shamir Piccolo	40.1	1.6				•	•	•
Shamir Piccolo	34.1	2.0				•	•	•	•	AO Compact	40.1	3.6				•	•	•
Rdnstk Life XS	32.3	5.6					•	•		Varilux Comfort	39.1	5.0					•	•
Sig Kod Concise	32.0	3.3					•	•	•	Sig Kod Concise	36.7	2.8						•
Sig Nav Short	32.0	7.2					•	•		Rdnstk Life XS	35.9	4.2						•
AO Compact	31.0	4.0						•	•	Sig Nav Short	35.6	3.6						•
Varilux Ellipse	29.3	2.5							•	Varilux Ellipse	35.6	2.6						•
Mean	39.2	8.1								Mean	43.0	5.6						

The ratings in Table 8 combine the ratings for distance and near viewing zones These ratings apply for general usage needs for patients for whom the intermediate viewing zone is not particularly important. The ratings that include astigmatism weighting apply to patients with sensitivity to unwanted astigmatism.

**Table 8.** General vision usage category, using combined ratings for distance and near (FH 18) zones. Ratings with and without weighting for astigmatism rating. Columns of dots indicate values that are not statistically different from one another. Highest and lowest rated designs, determined as explained in the text, are in **bold**.

		)ista	nc	e a	nc	l N	ea	ır (FH18) Combi	ined							
Without								· · · · · · · · · · · · · · · · · · ·	Astig	mat	isn	n				
PAL Design	Mean		no	Rar n-s	ign	s o ific	ant	PAL Design	Mean	SD		anç siç	gnii	of fica enc	nt	n-
Shamir Genesis	52.8	8.1	•					Shamir Genesis	53.4	5.7	•					
Vis Ease Outlk	51.5	7.1	•					Vis Ease Outlk	49.5	5.2	•	•				
Rdnstk Life AT poly	48.4	11.4	•					Younger Image	46.9	6.0		•	•			
Younger Image	45.1	8.3	•					Vis Ease Illumina	43.2	4.6			•	•		
Sig Kodak	37.2	6.4		•				Sig Kod Precise	41.7	4.9			•	•	•	
Sig Kod Precise	36.8	6.5		•				AO Compact	41.6	4.3			•	•	•	
Zei Gradal Top	36.3	6.6		•				Rdnstk Life AT poly	41.1	9.1			•	•	•	
Vis Ease Illumina	36.3	8.0		•				Varilux Panamic	40.8	2.7			•	•	•	
Rdnstk Life XS	35.3	5.5		•	•			Sig Kodak	39.7	4.3				•	•	
Sig Kod Concise	34.5	4.4		•	•			AO Easy	39.3	2.2				•	•	
Varilux Comfort	33.2	7.9		•	•			Zei Gradal Top	39.1	4.7				•	•	
AO Compact	33.1	5.3		•	•			Sig Kod Concise	38.6	3.5				•	•	
Varilux Ellipse	32.6	3.3		•	•	•		Shamir Piccolo	38.3	2.6				•	•	
Shamir Piccolo	31.8	3.4		•	•	•		Varilux Ellipse	38.1	3.1				•	•	
Sig Nav Short	31.8	5.2		•	•	•		Rdnstk Life XS	38.1	4.0				•	•	
Varilux Liberty	30.5	8.7		•	•	•		SOLA One	36.5	1.9				•	•	
Varilux Panamic	29.8	3.5		•	•	•		Varilux Liberty	35.7	5.9					•	
AO Easy	29.8	3.4		•	•	•		Sig Nav Short	35.5	4.8					•	
SolaMax	28.6	4.8		•	•	•		Varilux Comfort	35.5	5.7					•	
SOLA One	26.5	2.9			•	•		SolaMax	35.4	3.3					•	
Zei Gradal Brevity	23.8	4.5				•		Zei Gradal Brevity	34.7	3.1					•	
Pentax AF Mini	13.6	7.9					•	Pentax AF Mini	26.3	6.1						•
Pentax AF	12.0	9.0					•	Pentax AF	22.9	9.0						•
Mean	33.5	11.6						Mean	38.8	7.9						

## **Fitting Heights Compared**



**Figure 8.** Minimum suggested fitting heights based upon the measurements (error bar is standard deviation) and as suggested by the manufacturer. The black box indicates the suggested minimum fitting height based upon independent study measurements.

## Summary of best rated PAL designs by category.

	Lens design	Rating		Lens design	Rating
	Shamir Genesis	77.8	Best rating for	Rdnstk Life AT	50.9
Best rating for	Vis Ease Outlk	70.7	general vision	Shamir Genesis	50.5
distance	Rdnstk Life AT	67.5	- not	Younger Image	48.6
vision	Younger Image	57.5	considering	Vis Ease Outlk	48.4
	Zei Gradal Top	57.2	astigmatism	Zei Gradal Top	46.4
	Shamir Piccolo	50.1	astigiliatisiii	Sig Kodak	45.2
	Sig Kod Concise	48.5	Best rating for	Shamir Genesis	51.7
Best rating for	Sig Nav Short	48.2	general vision	Younger Image	49.6
near vision	AO Compact	45.1	- including	Zei Gradal Brevity	47.6
(FH 18)	Rdnstk Life XS	43.7	astigmatism	Varilux Panamic	47.4
(111 10)	Varlx Ellipse	40.0	astiginatism	Vis Ease Outlk	47.2
	Vis Ease Illumina	38.3			
	SolaMax	38.2		Lens design	Min Fit ht
	Varlx Panamic	73.9		Varlx Ellipse	15.1
	AO Easy	67.9		Rdnstk Life XS	15.6
Best rating for	Zei Gradal Brevity	67.7	Shortest	Sig Kod Concise	15.8
unwanted	AO Compact	67.4	corridor	AO Compact	15.8
astigmatism	SOLA One	66.6	lenses	Sig Nav Short	16.0
	Pentx AF Mini	64.2		Shamir Piccolo	16.0
	Vis Ease Illumina	64.0		Vis Ease Illumina	16.8