

## Does your lens have a belly button ?

If it has a diaphragm, then the answer is yes, and the next questions are:

**is your lens an "innie" or an "outtie" (or something else) ?**

**which is better ?**

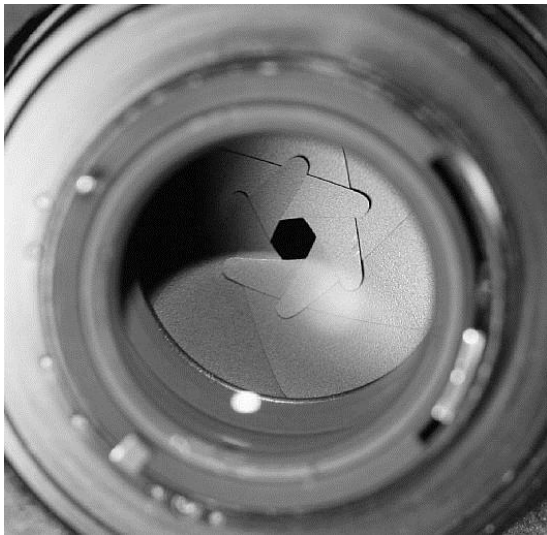
**does Jim have too much time on his hands ?**

I have conducted a personal survey of 49 lenses, and the results are described below.

### Belly Button Definitions

- i = innie, the tips of the diaphragm blades are visible through the lens rear element.
- o = outtie, the tips of the diaphragm blades are visible through the lens front element.
- s = smoothie, the tips of the diaphragm blades are not visible, or at least not obvious.

### Belly Button Pictures



**innie:**  
looking through the rear  
element into a  
SMC Takumar 135/2.5



**outtie:**  
looking through the front  
element into a  
Vivitar Series 1 135/2.3

## The Lenses

This lens belly button survey includes 37 prime lenses which are listed in Table 1, and 12 zoom lenses which are listed in Table 2. The innies are listed first, followed by the outties, and then the smoothies. The abbreviations used in Tables 1 and 2 are:

'Q' ..... SPLOSdb lens quality rating (see [www.jcolwell.ca](http://www.jcolwell.ca)),  
 'f' ..... focal length (or range of focal lengths for zooms),  
 f/ min ..... minimum f-stop (maximum aperture),  
 f/ max ..... maximum f-stop (minimum aperture),  
 Nb ..... number of diaphragm blades and  
 bb ..... type of belly button; i = innie, o = outtie, s = smoothie.

**Table 1: Prime Lens Belly Buttons**

Q		f (mm)	f/ min	f/ max	Nb	bb
*	Sigma	XQ Filtermatic MC (bi)	24	2.8	22	6 i
(!)	Pentax	SMC Pentax	28	3.5	22	5 i
	Lentar	Super-Lentar Auto	28	2.8	22	6 i
	Mamiya-Sekor	CS Auto	35	2.8	16	8 i
**	Carl Zeiss Jena	MC Flektogon DDR	35	2.4	22	6 i
*	Pentax	SMC Pentax -M	50	2	22	6 i
(!)	Pentax	SMC Pentax-F	50	1.7	22	6 i
**	Pentax	SMC Pentax	50	1.2	22	8 i
(!)	Tokina	AT-X Macro 1:2	90	2.5	32	8 i
**	Carl Zeiss Jena	MC Flektogon	135	3.5	22	6 i
(!)	Pentax	SMC	135	2.5	32	8 i
**	Pentax	S-M-C Takumar	135	2.5	22	6 i
*	Sigma	Sigmatel	135	1.8	22	8 i
*	Fujinon	EBC	200	4.5	22	6 i
*	Spiratone	YS	300	4	22	6 i
*	Vivitar	Auto Telephoto [Tokina]	400	5.6	22	8 i
*	Tokina	SL RMC	17	3.5	16	6 o
(!)	Pentax	SMC Pentax	18	3.5	22	5 o
**	Rokinon	Automatic wide MC	20	2.8	22	6 o
**	Vivitar	Wide Angle MC [Kino]	24	2	16	6 o
*	Tamron	BBAR MC 75° (Mod. 02B)	28	2.5	32	5 o
**	Kiron	MC	28	2	16	6 o
(!)	Pentax	SMC Pentax	35	3.5	22	5 o
**	Pentax	S-M-C Macro Takumar	50	4	22	5 o
**	Pentax	SMC Pentax-A	50	2	22	6 o
(!)	Pentax	SMC Pentax-A	50	1.7	22	6 o
**	Pentax	SMC Pentax-M	135	3.5	32	8 o
*	Vivitar	Close Focusing [Komine]	135	2.8	22	8 o
(!)	Vivitar	Series 1 VMC [Komine]	135	2.3	22	8 o
(!)	Vivitar	Series 1 VMC [Komine]	200	3	22	8 o
(!)	Tamron	SP Tele Macro (mod. 54B)	300	5.6	22	8 o
	Spiratone	Bellows Macrostar	35	3.5	16	5 s
	Meyer	Domiplan	50	2.8	22	6 s
	Helios	Helios 40-2 bk	85	1.5	22	10 s
**	Meyer	Orestegor	200	4	22	15 s
**	Spiratone	Plura-Coat Sharpshooter	400	6.3	32	13 s
**	Pentax	SMC Pentax	500	4.5	45	10 s

**Table 2: Zoom Lens Belly Buttons**

Q		f (mm)	f/ min	f/ max	Nb	bb
**	Tokina AT-X	24-40	2.8	22	7	i
*	Sigma DL HZ ASP IF	28-300	3.6-6.3	22	8	i
*	Sigma DL Macro Super 1:2	70-300	4.0-5.6	22	9	i
	Kiron Macro 1:4 MC	80-200	4.5	32	6	i
**	Vivitar S.1 Macro VMC [Komine]	70-210	2.8-4	22	9	i
*	Sigma Zoom ASP	18-35	3.5-4.5	22	6	i
(!)	Vivitar Series 1 VF VMC [Kino]	35-85	2.8	16	6	o
*	Kiron Macro 1:4 MC	70-150	4	22	6	o
	Sigma Multi-Coated	70-150	3.5	22	6	o
**	Vivitar S.1 Macro VMC [Kino]	70-210	3.5	22	6	o
*	Pentax SMC-F Zoom AL	70-210	4.0-5.6	32	9	o
(!)	Pentax SMC-FA AL	28-70	4	22	8	o

### The Results

Table 3 shows the number of lenses, N, the average quality, Qa, and standard deviation of Qa, sd(Qa), for each type of belly button, with prime lenses in the top part of the table and zooms in the bottom.

**Table 3: Results of lens belly button survey**

	Belly Button	N	Qa	sd(Qa)
Prime	i = innie	16	2.1	0.9
	o = outtie	15	2.3	0.8
	s = smoothie	6	2.0	0.0
Zoom	i = innie	6	2.0	0.9
	o = outtie	6	2.4	0.5

The average quality, Qa, is calculated for (!) = 3, \*\* = 2 and \* = 1. A few of the lenses don't have Q values, and so they are not included in the calculation of Qa. The difference in average quality between belly button types are all within one standard deviation of the averages - these differences are not *statistically significant*. In other words, lens quality does not appear to be related to the type of belly button (who would have guessed?).

### BTW - what gives with the SMC Pentax-A 50mm lenses ?

Innies: SMC Pentax 50/1.2  
SMC Pentax-F 50/1.7  
SMC Pentax-M 50/2

Outties: SMC Pentax-A 50/1.7  
SMC Pentax-A 50/2

What gives with the -A 50's ? Why are they outties but the others are innies ? Are the -A 50's some kind of bizarre experiment gone awry ? What about the other 50's ? Does anybody care ?