

## Choosing a Camera for your Polecam (Chip Size)

In respect to both sensor size and overall performance, Polecam believe the Toshiba TU-63 to be the best cost-effective choice for the following reasons.

Both the TU62 and TU63 camera heads use sensors with a useable identical pixel count of 752 x 560 as do all manufacturers of PAL TV cameras. To realise the maximum TVL resolution, manufacturers use a technique called "spatial-offset". By displacing the Green sensor approximately ½ pixel horizontally, results in an artificial resolution of approximately 750 TVL "Y" signal (11% of Blue + 59% Green + 30% Red). In essence what the Green CCD can't see/resolve the Red and/or the Blue will/may resolve and visa versa. It's this higher resolution figure that is quoted on product brochures. To be able to quote a resolution of 850 TVL, Sony for example increased the off-set value beyond the "norm" on the DXC-33P camera but at the expense of RGB registration so that they can claim 850 TVL of resolution. With normal subjects in white light you will technically benefit from the higher resolution. But if the subject is only lit with a primary colour of Red, Green or Blue the resolution regardless of "off-set" will be just 560TVL (752 pixels \* 0.75 = 564TV Lines for a 4:3 TV system).

All manufactures are guilty of introducing specification figures to the product brochure that are often difficult to interpret or prove.

The primary advantage of using a ½" sensor over a 1/3" is image geometry. For the same angle of view, the image distortion is approximately 30% better with a ½" camera (lens dependant). There are other benefits albeit small with respect to blooming and high light handling but the big limitation of the ½" camera is lens choice. For the 1/3" prism camera the following standard focal lengths are available: 2.8mm, 4.0mm, 6.0mm, 8.0mm and 15.0mm. With the exception of the 2.8mm all these lenses can be complemented with a range of wide-angle converters or an anamorphic adapter for 16:9 applications. This results in angles of view ranging from 85 down to 15 degrees horizontally being available.

The ½" prism camera does not enjoy the same degree of lens flexibility as the 1/3" with only 6.0mm, 8.0mm and 15mm lens options. Wide-angle adapters can be fitted but the resultant heavier lens combinations have a FOV limit of approx. 80 degrees. Zoom solutions with and without 16:9 capability are available for both the 1/3" and ½" cameras, but the widest focal length currently available for 1/3" and ½" prism cameras is 6mm.

Some final facts not to be overlooked when comparing TVL specifications. The maximum transmitted resolution for the PAL TV system is 540 TV Lines. All standard 4:3 digital formats are 720 pixels horizontally (720 X 0.75 = 504 TVL). Even the broadcast SDI (Serial Digital Interface) signal distribution standard has a bandwidth limit of 6.25MHz (1MHz = 80TVL therefore 6.25 MHz X 80TVL = 500 TVL).

So to recap.....Polecam believe the Toshiba TU-63 to be the best cost-effective choice for the above reasons. Additionally the ½" TU62 camera head has been in short very supply for nearly over a year now as the sensors used (Sony) have had technical shortcomings in respect of pixel defects.

### Lens FOV chart for the Toshiba TU62 (1/2") and the TU63 (1/3") Cameras

Lens Focal Length	TU62 FOV	TU62 Notes	TU63 FOV	TU63 Notes
2.8mm	X	2.8mm vignettes on TU62	85	OK
2.8mm + Anamorphic	X	Not possible to fit Anamorphic to 2.8mm	X	
4.0mm	X	4.0mm vignettes on TU62	77	OK
4.0mm + Anamorphic	X	X	102	OK
6.0mm	56	OK	44	OK
6.0mm + Anamorphic	74	OK	58	OK
8.0mm	44	OK	33	OK
8.0mm + Anamorphic	58	OK	44	OK
16.0mm	21	OK	17	OK
16.0mm + Anamorphic	28	OK	22	OK

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