

**For Immediate Release**

## **Panasonic Develops Two Compact Zoom Lens Units**

*Featuring the World's Thinnest\* (0.3-mm) Aspherical Glass Molded Lenses*

*Mounted on the LUMIX DMC-ZR1 and DMC-FX65*

\*Dimension of the thinnest lens portion. As of July 27, 2009, according to a Panasonic survey.

**Putrajaya, 29 July 2009** – Panasonic has developed the technology to mass-produce the world's thinnest aspherical glass molded lens[1]. The thinnest portion[2] of the lens measures 0.3 mm. Using the technology, Panasonic developed two zoom lens units – one with an 8x optical zoom and the other with a 5x optical zoom – for the LUMIX DMC-ZR1 and DMC-FX65 digital still cameras. These two models also feature POWER O.I.S.[3], a new digital image stabilization system developed in tandem with the lens units.

The newly developed lens units use super thin aspherical molded lenses that are half as thick as conventional concave lenses, thus enabling a further reduction in the thickness of compact digital still cameras. The DMC-ZR1 is equipped with a 25mm wide-angle (35mm film camera equivalent), 8x zoom lens unit with a thickness of 20.4 mm, while the DMC-FX65 comes with a 25mm wide-angle (35mm film camera equivalent), 5x zoom lens unit. Due to the new lens units, the DMC-ZR1 and DMC-FX65 are 2.1 mm thinner than previous Panasonic models with equivalent specifications.

The new zoom lens units offer the following features:

1. Lower image distortion at the periphery and less flare and ghosting[4] for sharp, clear pictures
2. A smaller lens unit size based on an original design, while incorporating an optical image stabilization system

Optical zoom	F-number[5]	Focal length[6] (mm)	Lens unit length (mm)	Camera model
8x	3.3-5.9	25-200mm	20.4	DMC- ZR1
5x	2.8-5.9	25-125mm	16.3	DMC- FX65

The following technologies were employed to create the super thin aspherical glass molded lenses and the compact zoom lens units housing the lenses.

- (1) A die and mold technology[7] for molding lenses with large differences in thickness[8], which is essential for producing super thin aspherical glass molded lenses
- (2) An optical design technology that utilizes the characteristics of super thin aspherical glass molded lenses to achieve both a compact size and high performance
- (3) A lens unit downsizing technology for achieving an optimal thin-dimension structure for the optical image stabilization system[9]

High-magnification lens units with more than 8x zooming power conventionally comprise a large number of lenses, thus resulting in a long unit size. This made it difficult to incorporate these lens units into a slim digital still camera. Reducing the thickness of the lens also increases the difference between the thickest and thinnest portions of the lens and requires complex control in the thermal cooling process conducted after molding. These factors had adverse effects on the optical characteristics of lenses.

## Description of Features

### 1. Lower image distortion at the periphery and less flare and ghosting[4] for sharp, clear pictures

#### •Minimum distortion at the periphery

Generally, as the field angle of the lens becomes wider, distortion tends to increase at the image edges with the wide-angle setting. In the newly developed zoom lens units, an aspherical lens is effectively arranged on the front lens section to capture images with minimal distortion at the periphery.

#### • Less flare and ghosting

At certain focal lengths, unwanted stray light commonly causes flare and ghosting on images captured by zoom lenses. In the development of the LUMIX zoom lens units, various tests were conducted while assuming a wide range of shooting situations, and appropriate countermeasures were employed to minimize flare and ghosting.

#### • Sharp, clear pictures

The image forming performance of lenses is improving, together with increased resolution achieved by a greater number of image sensors. In the newly developed lens units, the aspherical lens is optimally arranged to achieve high optical performance suitable for digital still cameras with 12-megapixel resolution or higher. When combined with the Venus Engine LSI, the new lens units capture sharp, clear images.

## **2. A smaller lens unit size based on an original design, while incorporating an optical image stabilization system**

The compact lens unit was achieved by employing super thin aspherical molded glass and redesigning the optical image stabilization mechanism for further miniaturization. The DMC-ZR1 is equipped with a 25mm wide-angle (35mm film camera equivalent), 8x zoom lens

unit with a thickness of 20.4 mm, while the DMC-FX65 comes with a 25mm wide-angle (35mm film camera equivalent), 5x zoom lens unit. Both the DMC-ZR1 and DMC-FX65 are 2.1 mm thinner than previous Panasonic models with equivalent specifications.

### **Description of Technologies**

#### **1. A die and mold technology for molding lenses with large differences in thickness[8], which is essential for producing super thin aspherical glass molded lenses**

With conventional glass lens forming methods, reducing the thickness of an aspherical glass lens increases the difference between the thickest and thinnest portions of the lens, thus resulting in a greater deviation in shape accuracy. In addition, problems such as cracking can occur. Therefore, for stable mass production of lenses exceeding 15 mm in diameter, the lens thickness had to be about 1.0 mm. By developing an advanced die and mold technology that includes a newly developed material, structure and protective coating, Panasonic succeeded in developing mass production technology for the high-quality, stable molding of super thin aspherical glass lenses with the high level of accuracy required by digital still cameras.

#### **2. An optical design technology that utilizes the characteristics of super thin aspherical glass molded lenses to achieve both a compact size and high performance**

The newly developed lens units utilize the characteristics of super thin aspherical glass molded lenses to reduce the overall optical path length in shooting as well as the thickness of the lens group, thus achieving a shorter dimension in the retracted condition.

Zooming aberration is also minimized by drawing on the aberration corrective effect of the aspherical lens, and the super-wide-angle focal length of 25 mm and high power of the 8x/5x optical zoom as well as high overall optical performance are attained by an optical design that is capable of providing accurate image formation with minimal distortion at the periphery even at the wide-angle setting.

### **3. A lens unit downsizing technology for achieving an optimal thin-dimension structure for the optical image stabilization system**

The optical image stabilization system corrects blurring caused by hand-shake by using gyro sensors to detect hand-shake and by controlling the motion of the corrective lens group according to the detection signal. Panasonic reduced the thickness of the optical image stabilization mechanism by optimally arranging the corrective lens group, position sensor and actuator device, thus further reducing the thickness and size of the lens units.

#### **Explanation of Terms**

##### [1] Aspherical glass molded lens

A glass lens whose surface shape has a profile that is not a portion of a sphere.

##### [2] Thinnest lens portion

Dimension of the thinnest portion of a lens. In the case of a concave lens, the center of the lens is the thinnest portion. In the case of a convex lens, the periphery of the lens (edge thickness) is the thinnest portion.

##### [3] POWER O.I.S.

POWER O.I.S.(Optical Image Stabilizer) is a new optical image stabilization system that offers twice the hand-shake correction performance as the previous optical image stabilization system by incorporating higher-performance gyro sensors and a newly developed control system.

[4] Flare and ghosting

Flare and ghosting are phenomena caused by bright light entering the lens unit and reflected by the lens or the inside surface of the lens barrel that is not part of the captured image. A polygonal-shape light image is called ghosting, while a flare appears as a cloudy film over the entire image.

[5] F-number

The F-number is a numeric specification of lens units that indicates the brightness of the lens. The smaller the F-number, the brighter the images captured by the lens unit.

[6] Focal length

The focal length is a numeric specification of lens units. A short focal length yields a wider field of angle, while a long focal length provides a telephoto effect.

[7] Die and mold technology

Technology related to molding, such as the mold material, structure and protective coating.

[8] Lens with a large difference in thickness

A lens with a large difference between the thickest and thinnest portions.

[9] Optical image stabilization system

The optical image stabilization system minimizes image blurring caused by hand-shake. It works by moving a part of the lens group according to the degree of hand-shake. Compared to methods that use an electronic system or that increase ISO sensitivity to compensate for hand-shake, an optical image stabilization system provides superior correction performance without affecting the image quality or shutter speed.

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