

Customers often say, "People don't care about quality, they just want the best price."

We can appreciate that sentiment. TI-BA has marketed many different detectors over the years. Each one has strengths and weaknesses. When researching a market crowded with so many products that appear very similar, often we resort to making decisions based on things we can relate to. A lot of times, the decision boils down to price, and that's a shame.



Because there's a universally accepted performance metric that clears up the clutter.

Detective Quantum Efficiency. DQE is the measurement of the dose efficiency of a flat panel detector (FPD), in converting x-ray energy into a diagnostic image. Dose efficiency needs to be measured at a meaningful spatial frequency. Studies have shown that a spatial frequency around 3 cy/mm is critical for diagnostic accuracy. <https://pubs.rsna.org/doi/10.1148/radiology.174.3.2305071>



So, how can we simplify the DQE conversation?

Miles-Per-Gallon (MPG) is calculated by measuring the number of miles a car can travel using a gallon of gas at a defined rate of speed. "Highway" MPG is measured at 50 miles per hour (mph).

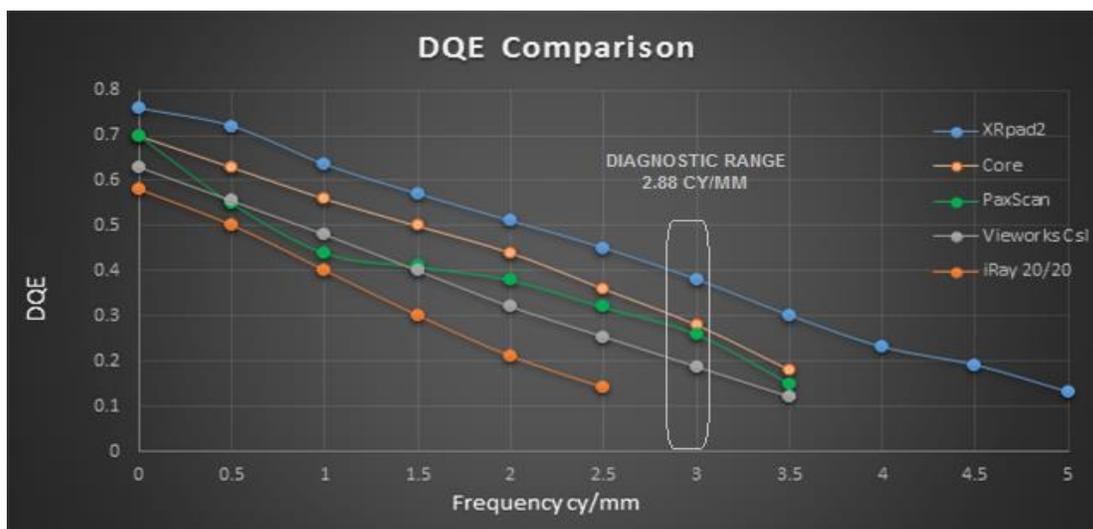
Car makers report fuel efficiency results to the Environmental Protection Agency (EPA), which regulates emissions for the car industry. Required MPG reporting allows consumers to make an educated buying decision based on this factor, which has nothing to do with price or appearance.

DQE directly correlates to the amount of radiation patient's receive to create an x-ray image. The better the dose-efficiency of the detector, the lower the dose needed to create that image. A low DQE score means that more dose is needed to create the same image.

Why aren't the people who purchase detectors basing decisions on dose efficiency?

Now, let's look at some DQE comparisons between detectors using the manufacturer's own data.





The graph above plots DQE values of several popular FPDs using published DQE data. The vertical axis shows the DQE value for each detector. A DQE value of 1.0 would be a perfect “signal-to-noise” ratio. While the horizontal axis shows the change in DQE at finer levels of spatial frequency or detail. As a detector collects x-ray photons at finer detail levels its’ efficiency declines.

## Interpreting DQE in terms of MPG is very instructive

Using the same graph, imagine the vertical axis as a car’s MPG fuel efficiency and the horizontal axis is the car’s speed. When the car is parked (0 cy/mm), MPG is excellent. But as the car starts to accelerate, the fuel efficiency decreases. HWY MPG is measured at 50 mph (3 cy/mm on the graph). It’s that simple.



## One detector outperforms the rest of the field at the diagnostic range of 3 cy/mm.

XRpad 100 micron detectors by Varex Imaging are the most dose-efficient FPDs in the world, allowing you to reduce patient dose exponentially vs. competitors *and* your current image solution.

Choosing an example from the figure, iRay 20/20 is the least efficient detector. iRay, does not publish a DQE value for its detector at 3 cy/mm, but based on its’ DQE trend, it can be reasonably deduced that its DQE is less than 0.1%. By contrast, DQE for the XRpad is 0.45% at 3 cy/mm.

**Meaning: The iRay 20/20 solution requires 3 times more dose to create the same image and struggles to provide meaningful diagnostic detail @ 3cy/mm.**

**Call or email us today to learn more about XRpad DR solutions.**

**TI-BA Enterprises is an authorized reseller of Varex Imaging products.**

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