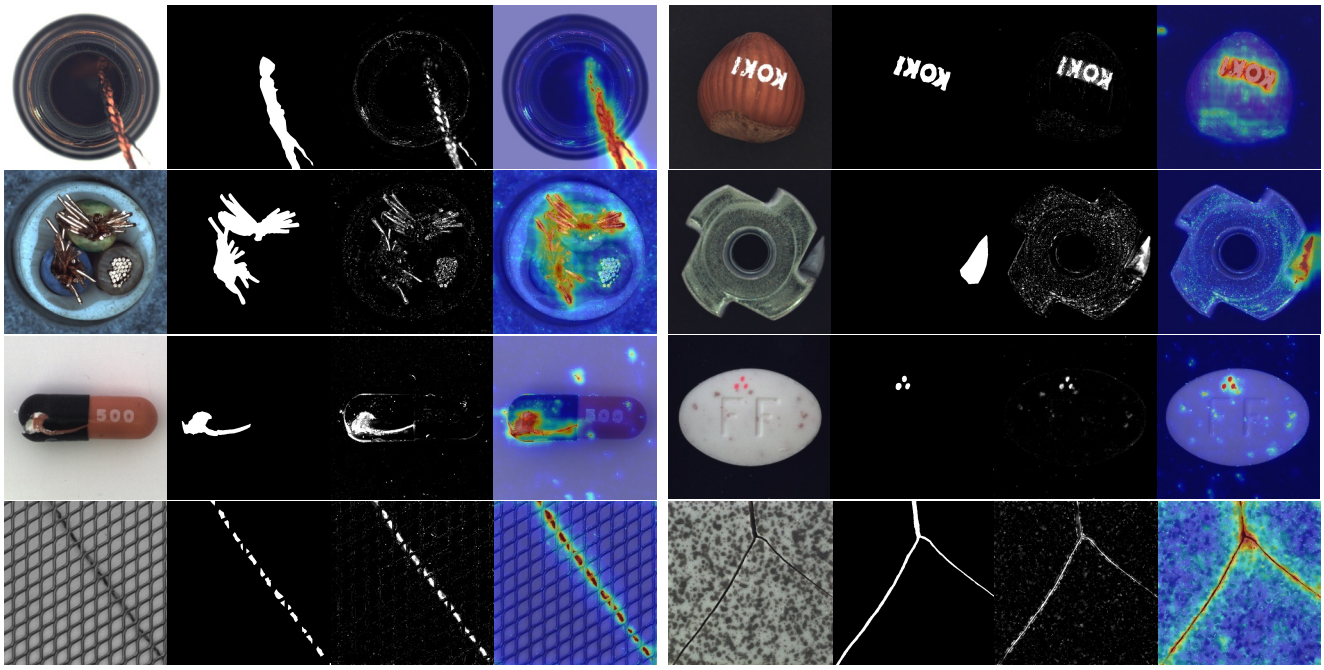

Figure 6: Visualization of anomaly localization on MVTec-AD [3]. The columns from left to right present anomalous images, the corresponding ground truths, our pixel-level predictions based on KL divergence, and the visualization of the final anomaly map on the original image. Our denoising diffusion models produce boundary-aware pixel-level anomaly scores to improve the quality of final anomaly scores.

adopt EfficientNet [30] as our feature extractor, where the dimension of features is relatively small. We select the intermediate feature map of stride $(2, 4, 8, 16)$ with dimension $(24, 32, 56, 160)$, resize to 64×64 and concatenate them together into a tensor $\boldsymbol{f} \in \mathbb{R}^{272\times64\times64}$. We conduct experiments to verify the resolution of the concatenated features; see Tab. 2. Increasing resolution from 16×16 to 64×64 increases the PRO by 2.5%. Combining EfficentNet features of stride $(2, 4, 8, 16)$ improves the PRO by 3.5%.

Unified model. Since our denoising diffusion model is capable of modeling complex real industrial data distribution, we conduct experiments to use a single model for anomaly localization for all categories of MVTec-AD, see Tab. 3. The performance of DRAEM [40] and PaDiM [8] drops greatly for the unified setting, with more than 5% degradation in the PRO metric. In contrast, our model still achieves 93.0% in PRO, with less than 1.1% performance drop.

4.5. Qualitative results of reconstruction.

We show in Fig. 7 that our denoising gradient process can smoothly transform an anomalous image into a normal one under the guidance of a pre-trained feature extractor. The left two columns are ground truth and input anomalous

Resize	Stride 16	8	4	2	AUROC	PRO
64	✓				94.2	90.2
	✓	✓			95.8	91.9
	✓	✓	✓		96.4	93.2
	✓	✓	✓	✓	**96.7**	**93.7**
32	✓	✓	✓	✓	96.6	92.4
16	✓	✓	✓	✓	95.5	91.2

Table 2: Ablation study of feature level reconstruction. Experiments are conducted with features from different layers of EfficientNet [30], resized to different resolutions.

Method	Base AUROC	Base PRO	Unified AUROC	Unified PRO
PaDiM[8]	**97.8**	92.8	90.5	85.3
DRAEM[40]	97.3	93.0	89.4	82.2
UniAD[36]	96.6	-	**97.0**	91.1
Ours	96.7	**94.1**	96.0	**93.0**

Table 3: Comparison of a single unified model for anomaly localization of all the categories on MVTec-AD.