

# 膜板显影与修饰

## 操作指南

显影、干燥与修饰是网版制作的最后三道工序。虽然这些工序并不复杂，但为了制作出高质量网版，您仍需注意若干要点。

### 冲洗台

网版显影应使用与网版清洁台相分离的专用冲洗台。这样可以避免膜板受到脱膜剂中化学成分的污染。

冲洗台应置于黄色安全灯区域以免网版在等待显影时出现“雾影”，同时应设有一盏白色背光灯以便在冲洗期间检查网版。

### 水温与水压

应对冲洗水进行过滤以免水中颗粒物沾粘在柔软的乳胶表面。膜板显影的最佳温度为 15 - 30°C；温度过低会降低冲洗速度，而温度过高则会使乳胶过于柔软并出现膨胀。

应采用较高的冲洗压力 (4-6 BAR) 和正确的喷洒方式。其目的在于快速溶解和冲掉未曝光的乳胶，同时确保膜板不会软化或损坏。人工清洗时，应首先喷湿网版刮刀面，然后再以膜板较为集中的印刷面为主进行冲洗。

如需使用高压喷枪 (HPG) 冲洗膜板，应选择扩散喷流模式并确保喷枪与膜板之间至少保持 0.5 米距离。切勿对刮刀面使用喷枪，否则会将膜板从丝网上吹掉。

对于超高清应用的小型网版显影，使用压缩空气加速冲洗可有效提高图案的精细层次，并且这种冲洗对精细线条/线迹的影响度极低。



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### 自动冲洗

对于快节奏印刷车间里的大型网版，可以使用高效的自动冲洗系统。这些大型显影设备可从两侧冲洗网版并且循环使用显影水以节省水源。

### 膜板冲洗缺陷

**膜板损坏** – 冲洗期间膜板融断通常是因为整体曝光不足和/或曝光前干燥不充分（参见曝光与干燥操作说明）。水温或水压过高也会导致膜板损坏。

对超厚膜板 (大于 100 微米) 进行显影时，应避免尝试对网版进行预先浸泡，否则会造成膜板软化进而导致膜板在冲洗过程中损坏。仅在印刷面采用高压喷水可获得最佳冲洗效果。

**浮渣** – 存在于干燥后膜板上的透明光亮残留物，通常由刮刀面冲洗不彻底（也是曝光不足的表现）或循环冲洗水中的乳胶堆积所致。

### 烘干

经过冲洗的网版必须彻底干燥后方可用于打印。最好使用温暖(最高温度 45°C)、通畅的空气从网版两侧进行烘干。可通过使用干湿两用专业吸尘器去除网版表面的过多水分，从而加快网版烘干速度，但须注意保护柔软的感光乳胶表面不被损坏。



用新闻纸来干燥膜板的方法并不可取，因为这样会在膜板表面留下难以祛除的纸纤维（尤其是曝光不足的膜板）。

网版可以根据需要而采取横向或竖向式烘干，但建议使用专用的网版干燥器。烘干后的网版在开始印刷之前最好静置 24 小时以使其继续干燥并达到最佳耐久度，这对光敏聚合物膜板尤为重要。

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### 检查与填补孔隙

烘干结束后，需要仔细检查膜板是否存在缺陷并填补所发现的任何孔隙。对于大型网版，使用近距离垂直灯箱进行检查的方法比水平桌面检查更为实用。

必须在背景光下检查以便找出最微小的缺陷。所有溶剂型油墨和紫外光固化油墨的缺陷修补均应使用专业型封网胶，例如标准封网胶。水性油墨缺陷应使用敏化乳胶，另外还需要对网版进行后曝光以使乳胶硬化。可以使用旧信用卡或小刮胶斗来填补较大的缺口。微小孔隙可使用修版毛笔进行填补，修整后的表面应保持平滑。

### 后曝光

关于后曝光的好处存在很大争议。若使用敏化乳胶填补孔隙，则需要在网版烘干结束后用紫外线灯光对其进行后曝光，但这种曝光对单一固化影印膜板却几乎没有效果。后曝光对双重固化影印膜板抗水性能的提升极其有限，但对光敏聚合物膜板抗水性能的提升却非常明显。后曝光处理并不能代替正确的首次曝光，并且对一个极其曝光不足的膜板不会产生任何效果，无法对其进行固化。

### 胶带加固

大多数网版在印刷之前都需要采取胶带加固措施。所选择的胶带类型取决于打印油墨的类型，例如水性或溶剂型油墨。注意不要使用厚胶带，否则会影响与基底的接触或刮刀移动。使用胶带时不要过度拉伸胶带或弯曲丝网，否则会导致印刷图像变形。使用胶带加固多个网版会耗用较高的资金和人力成本，因此在网版制作过程中应尽量保证网版质量。

### 总结：

网版制作过程中的每个步骤都很重要并且存在影响最终输出效果的各种变动因素。掌握网版制作的所有基本要素和系统性的故障查询方法有助于获得长久性效益。



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