

# 机舱舾装

Outfitting your aircraft's cabin



现代化商务喷气式飞机的舾装或翻新指装修或整修机舱内部的过程。这是一项复杂的工程，需要专门的技能和艺术才华。以下是 10 项指南，可以帮助您找到合适的专家并着手开展这项工作。

**1. 不要观望。** 假设私人飞机产业继续回升，则舾装或翻新工程可用的仓位将受到限制。记住在您将飞机送往舾装或翻新中心之前，还必须做大量的工作，很多工作需要占用您的时间。事实上，舾装过程可能在飞机送达中心前六个月或更早的时间就要开始。

**2. 决定您想要什么。** 与您的飞行员和首席机械师面谈，列一张机舱舾装清单。您想安装高速互联网连接吗？是否需要安装 Wi-Fi、高清娱乐系统、移动地图显示器或蓝光播放器？需要安装多少台视频监控器？需要多大的视频监控

**THE COMPLETION OR REFURBISHMENT OF A** modern business jet refers to the process by which the cabin is finished or reworked. It is a complex project requiring specialized skills and artistic talent. Here are 10 tips to help you find the right experts and get the ball rolling.

**1. Don't wait.** Assuming the private jet industry continues to rebound, available slots for a completion or refurbishment project will be limited. Take into consideration that before your airplane ever rolls into the completion or refurbishment center, a lot of work must be done, much of it requiring your attention. In fact, the outfitting process could begin six months or more before the airplane arrives at the center.

**2. Decide what you want.** Meet with your pilot and chief mechanic and make a list of what you'd like in the cabin. Do you

An airborne lounge, such as this one in an Asian motif (shown in a computer rendering by AirJetDesigns), can offer all the comforts of home. To get just the right look, consider consulting an interior designer.

空中休息室，例如此处展示的亚洲风格休息室（电脑中所示为 AirJetDesigns 公司设计），能让使用者感受到家居般的舒适。如需更精确的视觉效果，请咨询内部设计师。

器？您想要什么样的座位？需要厨房设施吗，如对流烘箱或垃圾压实机？您喜欢什么风格的照明、卫生间和淋浴？然后将您的清单分为两组，即您想要什么和您需要什么，从而最大限度地利用可用预算在最短的时间内完成舱装。当您与舱装和翻新中心的设计师和工程师面谈时，请随身携带您的清单。

**3. 考虑聘请独立顾问。** 现在，舱装和翻新项目通常聘用独立顾问，特别是庞大而复杂的机舱舱装项目。优秀的独立顾问可以管理项目（包括选择合适的飞机和管理最终试飞和交付事宜等），因此可为您节省大量时间和费用。此外，独立顾问了解您的需要，也了解舱装/翻新中心声称其所能办理的事项，因此能妥善处理这两者之间存在的潜在问题。他们了解政府的要求，也了解成品认证流程。

**4. 谨慎挑选舱装或翻新中心。** 现场考察您考虑的中心，和关键工作人员面谈，如舱装或翻新总监、精细家具和家具装饰店的负责人等。如果中心将服务外包，打听可能与您的项目有关的供应商的名称，并与其交谈。

打听中心的工作量和可预约时间。同时，询问中心是否符合政府的所有要求，是否投保以及投保险种。

参考？每个中心都可能曾经交付至少几个令人满意的、甚至优质的机舱项目。可电访某些老客户，获取更具体的信息。

选择过程最后一个阶段的工作包括删选清单和递交招标申请。如果您收到相当多的竞标请求，请不要惊讶。

want high-speed Internet connectivity? How about Wi-Fi, a high-definition entertainment system, moving-map display or Blu-ray player? How many video monitors and how large should they be? What kind of seats do you want? What about galley amenities such as a convection oven or trash compactor? What type of lighting, toilet and shower would you prefer? Divide your list into two groups—what you want and what you need—so as to make the best use of the available budget and time available for the work. Take your list with you when you meet with designers and engineers from completion and refurbishment centers.

**3. Consider an independent consultant.** Independent completion and refurbishment consultants are fairly common these days, especially with large and complex cabin-outfitting projects. A good one can manage the project—from picking the right airplane to the final test flight and delivery—and can save you a lot of time and expense. Further, independent consultants can work in that minefield between what you want and what the completion/refurbishment center says it can do. And they understand government requirements as well as the certification process for off-the-shelf items.

**4. Shop carefully for a completion or refurbishment center.** Visit centers you're considering and talk with key individuals, like the director of completions or refurbishment and the heads of the cabinetry and upholstery shops. If the center outsources, get the names of suppliers that are likely to be associated with your project, and talk with them.

Question the center's workload and slot availability. Also, ask whether the center meets all governmental requirements, and whether it is insured and at what level.



You're not likely to feel cramped in a Boeing 747-8 master suite. This proposal was created by Greenpoint Technologies.

在波音747-8的卧室内，您不会有压抑的感觉。这一提议由Greenpoint Technologies公司率先提出。



This lounge galley, a computer rendering from Loher Raumexklusiv, features state-of-the-art technology and a striking Art Deco design.

由Loher Raumexklusiv提供的休息室厨房设计，融合了尖端科技与艺术设计理念。

**5. 关注设计和工程。** 一旦项目启动，则应确定您清单所列的所有愿望是否都能实现，如果可以实现的话，则应该计算成本。例如，为旧的 9g 座位重新裱面可能比安装新的 16g 座位节省多达 50 万美元。

在舾装/翻新过程中注意到这一点非常重要。这样您就会做出选择，包括灯光、织物、皮革、颜色、娱乐设备、机舱管理系统、显示器和地毯等。理论上讲，您需要事先确定数百个舾装细节，如果您不这样做，您可能会多花很多冤枉钱。

设计师和工程师会向您征询其他的问题。例如，您是否打算利用飞机提供包机服务？如果您打算这样做，则应该选择经久耐用的皮革、织物、地毯和装饰木材。

**6. 考虑未来机主。** 如果您的机舱非常特别，那么只有相对少量的购买者会对其感兴趣；当然谁都希望折价购买，因为他们在购买飞机后需对机舱进行翻新。

**7. 选择技术。** 大多数机主在做出选择时会考虑飞机的兼容性、耐用性和易维护性，是否使用了最新的技术，或系统是否容易升级。

最近的一个趋势是安装连接基座，为使用个人娱乐设备提供便利。这是因为从几年前开始，乘客会携带 MP3 播放器登机，他们会在舱内找寻连接基座，以使用机舱娱乐系统观看视频和听音乐，或使用大型机载显示器与伙伴分享视频和音乐。随着平板电脑和高速互联网连接使机载卫星电视慢慢淡出公众视线，这一趋势可能还会愈演愈烈。

References? Every center is likely to have done at least a few satisfactory, or even superior, cabin projects. Call some previous customers and ask detailed questions.

The last stage of the selection process involves cutting the choices down to a short list and sending requests for bids. Don't be surprised if there is a considerable range in the proposals you receive.

### *5. Pay attention to design and engineering.*

Once the project gets underway, it's time to find out whether all those ideas on your wish list are even possible—and if they are, what they'll cost. For example, reupholstering old 9g seats will be as much as \$500,000 less expensive than installing new 16g seats.

This is a critical point in the completion/refurbishment process. Here is where you will make choices covering everything from lighting, fabrics, leather, colors and entertainment components to the cabin-management system, monitors and carpet. There are literally hundreds of details that if not specified early on will come back to take a major bite out of your wallet.

The designers and engineers will have their own questions. For example, do you plan to make the airplane available for charter? If so, the additional wear and tear will dictate the type of leather, fabrics, carpeting and wood trim you should select.

### *6. Think about the next owner.*

If your cabin is very unusual, chances are that it will appeal to a relatively small pool of buyers; others will want a price break, because the first thing they'll want to do after purchasing the airplane is have the interior refurbished.





Airbus created this Phoenix Cabin Concept for Airbus Corporate Jet customers in Asia. The circular table shown in the computer rendering here facilitates work-related discussions and dining.

空中客车为其亚洲喷气机用户开创了这一凤凰小屋概念。电脑中展示的圆桌既可用于工作讨论也可作为就餐之用。

**8. 就进度达成一致。** 这是标识舾装或翻新工程进展情况经常使用的方法。大多数舾装和翻新中心将指派一个工作人员（或甚至一个技术团队）在规定的时间内检查工程进度，以确保工作按原计划进行且符合客户的要求。这些规定的时间通常是征求批准以进行下一步工作的时间点，可能包括进度付款。

与在后继阶段进行检查相比，在这个阶段发现问题或提出更改要求肯定会降低成本，有时候甚至会节省更多成本。因此，要做全方位检查，还要仔细检查。曾有一位喷气式飞机机主参观舾装中的厕所后发现，在坐下时就厕者无论如何也拿不到卫生纸。

**9. 进行“冷浸 (cold soak)”飞行。** 不要被这个术语吓住。制造商称之为“冷侵”飞行是因为会将飞机飞到其最高认证高度，并测试其各项功能和系统。要检测每个机柜的每个抽屉，还要逐一检测按钮和开关，这通常由舾装或翻新中心工作团队进行。测试清单可能包含 200 个或更多项目，必须对所有项目进行检测。一般来说，要进行两次飞行，一次针对公司，另一次针对航空管理局的代表。小型飞机可能需要进行多次飞行。大机舱喷气式飞机单次飞行可能需要 8 个小时或更长时间。

这些飞行的乘客通常仅限于参与测试项目的工作人员、中心的技术人员和航空管理局的代表，这些人员将对机舱内部进行认证。

第二次或第三次飞行会预留给机主和/或顾问和嘉宾。飞行距离大致相当于飞机的最远航程。在飞行途中，乘客将用一次餐、使用所有控制系统并检查是否存在任何工艺缺陷。

**10. 放松。** 试飞中未必能发现所有问题，不过不必担心，飞机享有两至三年的保修期。这也是为什么某些舾装和翻新中心会分配一位工作人员在长达数周（或数月）时间内跟踪您的飞机的原因，以确保在出现问题时能立即处理。

**7. Choose technology.** Most owners will make choices based on compatibility, durability and ease of maintenance, whether it is the latest technology available and whether the systems can be easily upgraded.

One recent trend is to incorporate interface docks for personal entertainment devices. This began several years ago as passengers began coming aboard with MP3 players and looking for a dock that would allow them to view videos and listen to music on the cabin-entertainment system, using large in-place monitors to share content with traveling companions. This trend could go a step further as tablet computers and high-speed Internet connections render even in-flight satellite television irrelevant.

**8. Agree on milestones.** This is the standard means of marking the progress of a completion or refurbishment project. Most completion and refurbishment centers will assign an individual, or even a team of technicians, to walk through at prearranged points in the process to ensure that the job is on schedule and the work meets specifications. These milestones typically represent points at which an approval is required before moving forward, and they may include progress payments.

Catching a problem or demanding a change at this point will almost always be less costly—sometimes much less costly—than at a later point. So look at everything, and closely. One jet owner visited the partially finished lavatory and discovered that, when seated there was no way the occupant could reach the bathroom tissue.

**9. Take a “cold soak” flight.** Don't let the term throw you. The manufacturers call the flight that because the airplane is taken to its maximum certified altitude and put through its paces. Every drawer in every cabinet, every button and every switch is tested, most often by the completion or refurbishment center team. The list may include 200 items or more, all of which must be checked off. There are often two such flights, one for the company and another for the aviation authority's representative. Small aircraft may require multiple flights. Larger-cabin jets might spend eight hours or more on a single flight.

The number of passengers on these flights is usually limited to individuals involved in the test program, the center's own technicians and the aviation authority representatives who will certify the interior.

The second or third flight is reserved for the owner and/or consultant and guests. It will last the equivalent of the aircraft's maximum range. On the way, the passengers will be served a meal, play with all the controls and examine the workmanship for any flaws.

**10. Relax.** Don't worry if you don't catch every little problem. That's why you have a warranty, which normally applies for two or three years. That's also why some completion and refurbishment centers will assign an individual to follow your airplane for weeks, even months, to ensure a prompt fix for anything that goes wrong.



Hundreds of design choices resulted in this VVIP galley (shown here in a computer rendering) by Loher Raumexklusiv. Make such decisions early or they will take a bigger bite out of your wallet.

Loher Raumexklusiv 的 VVIP 厨房为您提供上百种设计选择（如电脑中所示）。别犹豫了，您越早下定决心，享受的优惠越大。