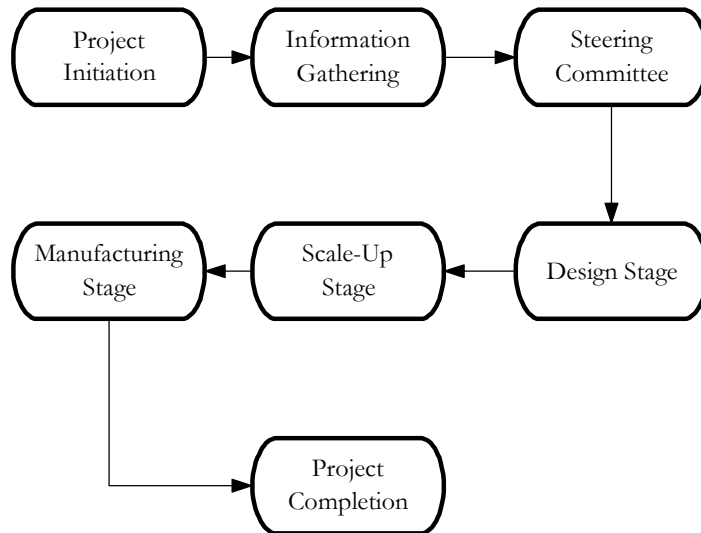


## CUSTOM DESIGN PROCESS

**The Arkwright Custom Product Development process helps assure new projects are properly initiated, resourced, and managed. Both the client and Arkwright share in the responsibilities of commercializing a successful product:**



### Project Initiation

Initial discussions at the Business Manager level may lead to a desire on the part of both parties to take the opportunity to a more formal level. Formal Project Initiation is the vehicle to insure that both Arkwright and the client have a common understanding of the new opportunity. Information that is typically required at the Project Initiation phase includes:

- Product design characteristics
- Volume forecasts
- Target price and cost information
- Time to market expectations

If this initial information indicates that the proposed project is a good fit for both parties a more formal Information Gathering phase is entered.

### Information Gathering

Due diligence information gathering is performed by Arkwright at this point. Required information includes defining the technology behind the project, obtaining intellectual property clearances, financial information, manufacturing requirements, raw material information, and a confirmation that the marketing assumptions in the project initiation are still valid. Prior to moving to the next phase, there are usually exchanges of feasibility samples between Arkwright and the client. These can take the form of standard product samples, laboratory draw-downs, or pilot plant coatings. Price points from the customer are a requirement at this stage. Arkwright will do its best to estimate pricing at this point. It must be understood by all that this estimate is not a quotation and final pricing can only be determined after

sufficient actual cost and yield data is analyzed from ensuing trial coating runs. After the above information is gathered, a recommendation as to whether or not the project should be carried forward is made to the Arkwright Steering Committee.

## **Arkwright Steering Committee**

Senior management makes a decision at this point whether or not to allocate the necessary resources to a project. These resources would include financial, human, and machine resources. At this point a team is formed to carry the project forward. A key member of the team is the customer. Upon approval, the client is consulted with and mutual agreement is obtained on a product development timeline. Both the client's needs and Arkwright's schedule and availability of resources will help determine this timeline. In addition, this is the point at which product development costs are agreed upon between Arkwright and the client. Product development costs will be confirmed in the form of a letter to the client and the client's sign-off or negotiated response. **The project now has a name, an identifying number, a timeline, development costs, and assigned resources.**

## **Design Stage**

Product design work is performed at this stage. Specifications and design characteristics are developed. Ideally, design work can begin with pilot coating runs. This minimizes the costs to all concerned. However, it is sometimes necessary to start the development machine trials on wide-web, production equipment. After a design is fixed and validated by both parties a Scale-Up phase is entered.

## **Scale-Up Stage**

Production machines trials are run in order to refine and validate process conditions for the project design. The typical development product can be transitioned to commercial status after at least three successful factory production trials that have used the same chemistry and process conditions. During this process, a formal price quotation is generated. Timing for this quote will be predicated on the success of each of the development runs.

On a parallel track during this step, the Client and the Arkwright Business Manager will draft the necessary supply agreement to insure that the commercialized product meets the client's logistical needs.

## **Manufacturing Stage**

At this stage, the project enters into a commercial production mode. Production runs are fully supported by Arkwright's technical staff until statistically valid data indicates that the product is ready for release to standard production.

## **Project Completion**

Production of the customer's product is released to Arkwright standard production.