

# Industrial Carbon Composites

## Use Cases

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Use Case Name: Web Portal is accessed by customer		ID Number: 1	
Short Description: describes how a customer accesses the Web Portal and logs in			
Trigger (External): Customer contacts Web Portal			
Major Inputs Description	Source	Major Outputs: Description	Destination
Existing customer ID	Customer	Customer information (incl. date/time)	Customer file
New customer information	Customer	New Customer ID	Customer
Potential Part idea	Customer	Part information Part ID	Part file Part file
Major Steps Performed		Information for Steps	
1. Customer accesses ICC Web Portal database. They are brought to a log in screen. If an existing customer, they log in with their customer ID		← Existing customer ID	
2. If the customer is new, they fill out a form with their customer information. They are then issued a customer ID		← New customer information → Customer ID	
3. Once the customer logs in, they can describe a part idea that they want to consult ICC about. This description is saved in a part file for later use		← Potential part idea → Part information	
4. The part is then assigned a Part ID		→ Part ID	

Use Case Name: Drawings are sent to Web Portal		ID Number: 2	
Short Description: describes how a customer uploads a basic part design to the Web Portal and how ICC uses this information to start job bid			
Trigger (External): Customer uploads drawings of the part			
Major Inputs Description	Source	Major Outputs: Description	Destination
Customer ID Part ID CAD drawing Potential Order Manufacturing requirements	Customer Customer Customer Customer Part file	CAD drawing Machine reservation (tentative) Bid Potential order Order number	Part file Schedule file  Customer Order file Order file
Major Steps Performed		Information for Steps	
1. Customer logs in to Web Portal with Customer ID and fills in Part ID		Customer ID Part ID	
2. Customer picks from a drop-down list of options the option to upload CAD drawings. Customer uploads CAD file to part file		CAD drawing CAD drawing	
3. (go to Use Case 4-5)			
4. ICC places bid on job and a "Potential Order" is sent to the order file		Bid Potential order	
5. After potential order is received, an Order number is automatically assigned in the order file.		Order number	
6. If a part has been fabricated by ICC before go to Use Case 11, if a part is new manufacturing requirements are determined from Part file		Manufacturing requirements	
7. A machine reservation is made tentatively for production of part		Machine reservation (tentative)	

Use Case Name: Inventory is scheduled for potential orders		ID Number: 3	
Short Description: describes how when a potential order is received, required materials are scheduled to be ordered			
Trigger (External): Potential order is received			
Major Inputs Description	Source	Major Outputs: Description	Destination
Potential order Material requirements	Order file Part file	Ordering schedule	Inventory manager
Major Steps Performed			Information for Steps
1. When a "Potential Order" is received, the materials required are gathered from the part file for the part to be produced			Potential order Material requirements
2. A list of material is then placed in an ordering schedule which is sent to the inventory manager			Ordering schedule

Use Case Name: CAD exchange of drawings and technical information		ID Number: 4	
Short Description: describes how engineers contact each other and exchange information			
Trigger (External): Collaboration of engineers			
Major Inputs Description	Source	Major Outputs: Description	Destination
Existing Engineer ID  New Engineer ID Engineer ID Design Design response Design response	Customer engineer  Customer engineer ICC engineer Part File ICC engineer  Customer engineer	Engineer information Formal design Part information Design response Design  Design	Customer file  Customer Part file Part File Customer engineer ICC engineer
Major Steps Performed			Information for Steps
1. Customer engineer logs in to Web Portal with Engineer ID. If a new engineer, they are assigned an Engineer ID			Existing Engineer ID New Engineer ID
2. ICC engineer logs in to Web Portal with Engineer ID			Engineer ID
3. When ICC receives part design, they clarify design with a design response, a new drawing, and updated technical information. This is all sent to the part file and accessed by Customer engineers, who send it back updated. (this continues to repeat)			Design Design response Design Design response
4. All part information is stored in the Part file and a formal design is sent to the customer			Part information Formal design

Use Case Name: Final design can be bid on		ID Number: 5	
Short Description: describes how price of manufacturing part, based on final design, can be bid			
Trigger (External): Design is finalized			
Major Inputs Description	Source	Major Outputs: Description	Destination
Formal design Part cost Bid	ICC engineers Part file Accounting	Formal Design Part cost Bid Final design	Part file Accounting Customer Customer
Major Steps Performed			Information for Steps
1. Once a formal design is reached, a copy of the design and information is put in the part file			<div style="display: flex; justify-content: space-between; align-items: center;"> <span>←</span> <span>Formal design</span> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>→</span> <span>Formal design</span> </div>
2. Costs from the part file are sent to accounting to formalize bid			<div style="display: flex; justify-content: space-between; align-items: center;"> <span>←</span> <span>Part cost</span> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>→</span> <span>Part cost</span> </div>
3. Accounting formalizes bid and sends it to the customer			<div style="display: flex; justify-content: space-between; align-items: center;"> <span>←</span> <span>Bid</span> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>→</span> <span>Bid</span> </div>
5. The Final design is then sent to the customer			<div style="display: flex; justify-content: space-between; align-items: center;"> <span>→</span> <span>Final design</span> </div>

Use Case Name:      Order is processed		ID Number:      6	
Short Description:      describes how an order is processed			
Trigger (External):      New order is recognized			
Major Inputs Description	Source	Major Outputs: Description	Destination
Customer ID New contract information (incl. date/time) Order Machine reservation (tentative)	Customer Customer  Customer Schedule file	Contract ID Contract information Order information Machine reservation	Customer Order file  Order file  Fabrication shop
Major Steps Performed		Information for Steps	
1. Customer logs in to Web Portal with Customer ID and picks “New Contract” from a drop-down list then enters contract information, this is time-stamped and sent to the order file.		←	Customer ID New contract information Contract information
2. Customer then submits the order at the end of the contract information the order information is sent to the order file.		←	Order Order information
3. When order is submitted, tentative machine reservation is found in schedule file and is made final. This reservation is sent to Fabrication shop		←	Machine reservation (tentative) Machine reservation

Use Case Name: Schedule machinery		ID Number: 7	
Short Description: describes how machinery is scheduled into the future to avoid a scheduling conflict			
Trigger (External): Scheduling conflict			
Major Inputs Description	Source	Major Outputs: Description	Destination
Order number Order schedule Machine reservation conflict Machine open	Order file Fabrication shop Schedule file  Schedule file	Master schedule  Order schedule	Fabrication shop Customer
Major Steps Performed			Information for Steps
1. Order number is entered in to Web Portal for scheduling.			← Order number
2. When a potential order causes a reservation conflict with machinery, the schedule file is searched for open times			← Machine reservation conflict ← Machine open
3. When open times are verified by the fabrication shop, the order is placed on the Master Schedule			← Order schedule → Master Schedule
4. An order schedule is sent to the customer telling them when they can expect their parts			→ Order schedule



Use Case Name: Check potential outsourcing options		ID Number: 8	
Short Description: describes how alternate facilities are located in case of a need for outsourcing			
Trigger (External): Order is received			
Major Inputs Description	Source	Major Outputs: Description	Destination
Order number Fabrication shop availability Outsource facility information Outsource facility availability	Order file Master schedule  Outsource file  Outsource facility	Fabrication shop schedule  Outsource facility schedule	Schedule file  Schedule file
Major Steps Performed			Information for Steps
1. When an order is received, the order number is logged in to check availability of fabrication shop from the Master Schedule, if the shop is available the order is placed on the fabrication shop schedule			Order number Fabrication shop availability Fabrication shop schedule
2. If it is uncertain whether or not the fabrication shop will be available to process the order, outsource facilities are located and their availability is determined. An availability schedule is then sent to the schedule file			Outsource facility availability Outsource facility schedule

Use Case Name: Find suppliers to provide inventory		ID Number: 9	
Short Description: describes how suppliers are found when the lead time for a job begins			
Trigger (Temporal): Lead time for job			
Major Inputs Description	Source	Major Outputs: Description	Destination
Automatic lead- time message Material requirements Supplier information	Master schedule  Part file  Supplier file	Supplier contact	Supplier
Major Steps Performed			Information for Steps
1. When an order is due to be processed an automatic lead-time message is generated from the Master Schedule according to the part requirements			Automatic lead-time message
2. The material requirements are gathered from the part file and a list of suppliers for those materials are found in the supplier file			Material requirements Suppliers
3. When suitable suppliers are found they are contacted with order information			Supplier contact

Use Case Name: Inventory is ordered		ID Number: 10	
Short Description: describes how inventory is ordered when supplier confirms he can provide the material			
Trigger (External): Material order is cleared by supplier			
Major Inputs Description	Source	Major Outputs: Description	Destination
Supplier ID Supply confirmation Material requirements Ordering schedule Purchase order	Supplier Supplier  Part file  Inventory manager Accounting	Purchase order	Supplier
Major Steps Performed		Information for Steps	
1. If a supplier can supply the materials, they log on to Web Portal with their supplier ID and confirm that they can ship the materials on time		Supplier ID Supply confirmation	
2. Material requirements are gathered from the part file and the ordering schedule is received from the inventory manager		Material requirements Ordering schedule	
3. An order is placed with the supplier		Material order	

Use Case Name: Web Portal database is accessed for part information		ID Number: 11	
Short Description: describes how the Web Portal database is checked for all requirements of existing part for manufacturing			
Trigger (External): Research group checks database for existing part information			
Major Inputs Description	Source	Major Outputs: Description	Destination
Part ID Environmental requirements Performance requirements	Part file Part file Part file	Manufacturing requirements	Fabrication shop
Major Steps Performed			Information for Steps
1. If a part has been designed or manufactured by ICC before, Research Group logs the Part ID into the Web Portal to check for part information			Part ID
2. Environmental and performance requirements are gathered and sent as “Manufacturing Requirements” to the fabrication shop			Environmental requirements Performance requirements Manufacturing requirements

Use Case Name: Obtain outsourcing in case of too much work		ID Number: 12	
Short Description: describes how outsourcing is obtained when there is too much work			
Trigger (External): Unexpected influx of work			
Major Inputs Description	Source	Major Outputs: Description	Destination
Order number Fabrication shop schedule Outsource facility schedule	Order file Schedule file  Schedule file	Outsource facility contact	Outsource facility
Major Steps Performed			Information for Steps
1. Order number is logged in to Web Portal to check schedule.			Order number
2. If the fabrication shop shows too much work, the outsource facility schedule is consulted to find an open facility where work can be outsourced			Fabrication shop schedule Outsource facility schedule
3. When an open facility is found to do the outsourcing they are contacted with order information			Outsource facility contact

Use Case Name: Work is sent out		ID Number: 13	
Short Description: describes how work is sent to alternate facilities			
Trigger (External): Work is outsourced			
Major Inputs Description	Source	Major Outputs: Description	Destination
Outsource facility ID Outsource facility schedule confirmation Order schedule Purchase order Material handling tool consignment	Outsource facility Outsource facility Schedule file Accounting Custom-design group	Purchase order Material handling tool consignment	Outsource facility Outsource facility
Major Steps Performed			Information for Steps
1. Outsource facility logs on to Web Portal with Outsource Facility ID			← Outsource facility ID
2. Outsource facility confirms that their schedule is open and they can produce the parts			← Outsource facility schedule confirmation
3. The order schedule is sent to accounting where a purchase order is drawn and sent to Outsource facility			← Order schedule → Purchase order
4. The material handling tool consignment for the part is obtained from the Custom-Design group and sent to the outsource facility			← Material handling tool → Material handling tool
Use Case Name: Order is changed		ID Number: 14	

Short Description: describes what happens when an order is changed			
Trigger (External): Change / cancellation of order			
Major Inputs Description	Source	Major Outputs: Description	Destination
Order number Order schedule (changed) Order change Order acceptance/confirmation Order cancellation	Order file Fabrication shop  Customer Customer  Customer	New order schedule Revised order / machine schedule Order cancellation / machine schedule	Customer  Fabrication shop  Fabrication shop
Major Steps Performed			Information for Steps
1. Order number is logged in to Web Portal for scheduling changes in case of a scheduling conflict. If schedule is changed, the new schedule is sent to the customer.			Order number Order schedule (changed) New order schedule
2. The customer may then change their order. If an order is changed (size, quantity, delivery date) it is sent to fabrication shop to revise machine schedule			Order change Revised order / machine schedule
3. If the new order schedule is accepted by the customer, it is then sent to fabrication shop to revise machine schedule			Order acceptance / confirmation Revised order / machine schedule
4. If the new order schedule is not accepted, the customer may cancel their order. If the customer, for any reason, cancels their order, the cancellation is sent to the fabrication shop to clear machine scheduling			Order cancellation Order cancellation / machine schedule
Use Case Name: Outsourcing is obtained in case of emergency			ID Number: 15

Short Description: describes how outsourcing is obtained when there is an emergency such as a machine failure			
Trigger (External): Emergency / machine failure			
Major Inputs Description	Source	Major Outputs: Description	Destination
Order number Emergency report Outsource facility schedule	Fabrication shop Fabrication shop  Schedule file	Outsource facility contact	Outsource facility
Major Steps Performed			Information for Steps
1. The fabrication shop logs the Order number into the Web Portal and files an emergency report, stopping the production process			Emergency report
2. Outsource facility schedule is checked to find an open facility. When an open facility is found, they are contacted with order information (go to Use Case 13)			Outsource facility schedule Outsource facility contact



Use Case Name: Job status query		ID Number: 16	
Short Description: describes how a customer checks status of job through the Web Portal			
Trigger (External): Customer checks status of job			
Major Inputs Description	Source	Major Outputs: Description	Destination
Customer ID Order number Job status	Customer Customer Order file	Job status	Customer
Major Steps Performed			Information for Steps
1. At any time after order is received customer may log in to Web Portal and pick from a drop-down list their order number to check status of job			Customer ID Order number
2. Job status is retrieved from the order file and status is presented to customer			Job status Job status

Use Case Name: Completion of job is processed		ID Number: 17	
Short Description: describes how when a job is complete information is routed to shipping and billing			
Trigger (External): Job is completed (shipped and billed)			
Major Inputs Description	Source	Major Outputs: Description	Destination
Order number Job costs Shipping costs	Order file Order file Shipping department	Manufacturing / design costs Shipping costs Invoice	Accounting  Accounting Customer
Major Steps Performed			Information for Steps
1. When a job is completed, the Order number is logged in to Web Portal to end process.			Order number ←
2. The job costs and shipping costs are sent to accounting to formulate an invoice, which is then sent to the customer			← Job costs ← Shipping costs ← Invoice

Use Case Name: New technology is conveyed		ID Number: 18	
Short Description: describes how any new technology learned on previous job is entered into the Web Portal			
Trigger (External): New technology information is entered into database			
Major Inputs Description	Source	Major Outputs: Description	Destination
Engineer ID Part ID Technical information Part drawing (final)	ICC engineer Part file Part file  Part file	New part information	Technology information database
Major Steps Performed		Information for Steps	
1. After completion of job, ICC engineer logs into Web Portal to register all part information		← Engineer ID	
2. ICC engineer registers Part ID, technical information, and the final part drawing into Technology Information Database		← Part ID ← Technical information ← Part drawing (final) → New part information	