# Orders API

The Orders endpoint represents a resource containing approved requests. Requests specify a set of samples approved for processing in Lab Operations. The endpoint parameters are applied to the operations order retrieval, creation, cancellation, reset, completion and update.

Relevant endpoints are described in each topic heading, required and optional parameters, typical requests and responses (in JSON format) are described following. Optional parameters and objects are listed in a reference.



## Order

- Methods:
  - GET: retrieve a list of orders
  - POST: create (many)
  - PUT: update, cancel, complete, reset
  - DELETE: remove
- Headers:
  - application/json
  - Pagination
    - skip (number): parameter that defines the number of entries that are ignored before returning a response.
    - take (number): parameter that defines the number of entries returned in a single response.
    - count (boolean): true or false boolean.

### Order - standard parameters

A *well formed* order in Lab Ops specifies the parameters described in the following table.

[1] Orders `id` value is generated automatically by Lab Ops for orders in the database.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | `id`[1] | - | UUID | `o1z2GaZzKuS3s5cX6npsKD` |
| 2 | `name` | - | string | `test 1` |
| 3 | `description` | - | string | `...` |
| 4 | `tags` | - | array | `[]` |
| 5 | `recipients` | - | **object** | `success@simulator.amazonses.com` |

| | | | | |
|---|---|---|---|---|
| 6 | recipients address | - | string | Spinnereistraße 7, 95445 Bayreuth |
| 7 | format | - | **object** | vial liquid |
| 8 | name | format | string | 384 - IC50 - 8 Points - 3.162 DF |
| 9 | targetContainerType | format | string | GR384 |
| 10 | materialState | format | string | Liquid |
| 11 | dilutionSeries | format | numbers (array) | [3.162, 3.162, 3.162 ...] |
| 12 | wellVectors | **format** | **object** | ? |
| 13 | type | *wellVectors* | string | Sample |
| 14 | instanceNumber | *wellVectors* | number | 0 |
| 15 | start | *wellVectors* | **object** | - |
| 16 | rows | *start* | number | 0 |
| 17 | columns | *start* | number | 0 |
| 18 | wells | *wellVectors* | number | 1 |
| 19 | direction | *wellVectors* | string | East |
| 20 | spacing | *wellVectors* | number | 0 |
| 21 | index | *wellVectors* | number | 0 |
| 22 | rows | format | number | 16 |
| 23 | columns | format | number | 24 |
| 24 | lineItems | - | **object** | - |
| 25 | amount | **lineItems** | number | 60 |
| 26 | topConcentration | **lineItems** | number | 10 |
| 27 | status | **lineItems** | string | pending |
| 28 | sourceType | **lineItems** | string | sample |
| 29 | sourceInventoryItem | **lineItems** | **object** | - |
| 30 | containerBarcode | sourceInventoryItem | string | Test tube |
| 31 | position | **sourceInventoryItem** | **object** | - |
| 32 | row | position | array | 0 |
| 33 | column | position | array | 0 |
| 34 | externalReferences | lineItems | array | [] |
| 35 | orderFragments | - | array | [] |
| 36 | status | - | date | created |
| 37 | isLineSequenceRelevant | - | string | false |
| 38 | controlVolume | - | number | 1 |
| 39 | numberOfCopies | - | number | 1 |

### order Example - JSON format


```
{
    "name": "Late binding test 1",
    "description": "Order to test late binding",
    "tags": [],
    "recipients": ["success@simulator.amazonses.com"],
    "recipientAddress": "Cypress",
```

```
    "format": {
      "name": "Solubilization Test Format",
      "targetContainerType": "1.4ml Tube",
      "materialState": "Liquid",
      "dilutionSeries": [],
      "wellVectors": [
        {
          "type": "Sample",
          "instanceNumber": 1,
          "start": {
            "row": 0,
            "column": 0
          },
          "wells": 0,
          "direction": "East",
          "spacing": 0,
          "index": 0
        }
      ],
      "rows": 1,
      "columns": 1
    },
    "lineItems": [
      {
        "amount": 60,
        "topConcentration": 10,
        "status": "Pending",
        "sourceType": "Sample",
        "sourceInventoryItem": {
          "containerBarcode": "LateBindingTestTube",
          "position": {
            "row": 0,
            "column": 0
          }
        },
        "externalReferences": []
      }
    ],
    "orderFragments": [],
    "status": "Created",
    "isLineItemSequenceRelevant": false,
    "controlVolume": 1,
    "numberOfCopies": 1
  }
```


#### Query Orders (objects)

- Method:
  - GET
- lab-operations/{lab}/orders2

Query parameters for the `orders2` endpoint specifies orders retrieval in the Lab Operations database and are described in the following table.

[2] Denotes attributes that apply to every query object except for *id* and *type*.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | `id` | - | **object** | `4` |
| 2 | `mode` | id | boolean | `default` |
| 3 | `in` | id | string (array) | - |
| 4 | `notIn` | id | string (array) | - |
| 5 | `name` | - | **object** | - |
| 6 | `equals`[2] | name | string | - |
| 7 | `mode`[2] | name | boolean | `default` |
| 8 | `in`[2] | name | string (array) | - |
| 9 | `notIn`[2] | name | string (array) | - |
| 10 | `contains`[2] | name | string | - |
| 11 | `startsWith`[2] | name | string | - |
| 12 | `endsWith`[2] | name | string | `7` |
| 13 | `format` | - | **object** | `Liquid` |
| 14 | `status` | - | **object** | `inactive` |
| 15 | `type` | - | **object** | - |
| 16 | `in` | type | string (array) | - |
| 17 | `value` | - | string | - |
| 18 | `fields` | - | string (array) | `name, status` |
| 19 | `message` | - | string | - |
| 20 | `tags` | - | **object** | - |
| 21 | `lab` | - | string (path) | `bt` |

## getOrder Response Example - JSON Format

The following code snippet demonstrates the response returned when a query is submitted with some values left empty.

getOrder Response JSON Format


```
{
  "orders": [
    {
      "tags": [],
      "priority": "Low",
      "numberOfCopies": 1,
      "id": "5788915c-af39-46a1-90ea-5c6d4a1cb61f",
      "name": "Star-Echo + ACI",
      "description": "Star Echo Order with ACI",
      "createdBy": "System",
      "recipients": [
        "success@simulator.amazonses.com",
        "john@smith.com",
        "james@hetfield.org"
      ],
```

```
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:16.296Z",
      "status": "Ready",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
      "tags": [],
      "priority": "High",
      "numberOfCopies": 1,
      "id": "c5b588b1-37a9-46b8-a09d-1763f08849ff",
      "name": "Serialize from preintermediate",
      "description": "this one models a serialization from a
preintermediate (Star-Star)",
      "createdBy": "System",
      "recipients": [
        "success@simulator.amazonses.com"
      ],
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:14.118Z",
      "status": "Ready",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
      "tags": [],
      "priority": "High",
      "numberOfCopies": 1,
      "id": "09a00e19-ffca-4bbb-9483-f043f2db7215",
      "name": "Test Order 3",
      "description": "Transfer SourceTube to Plate",
      "createdBy": "System",
      "recipients": [
        "success@simulator.amazonses.com"
      ],
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:14.806Z",
      "status": "Ready",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
      "tags": [],
      "priority": "Medium",
      "numberOfCopies": 1,
      "id": "aa114394-190b-4e29-ae4d-2b9c2a3812da",
      "name": "New Order 2",
      "description": "Sources on Plates",
      "createdBy": "System",
      "recipients": [
```

```
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-07-07T10:23:15.167Z",
    "status": "Ready",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "Low",
    "numberOfCopies": 1,
    "id": "16d8c109-573a-4b30-9701-36ddd2dbf18a",
    "name": "Solubilization + Star Only",
    "description": "Solubilization and star only order",
    "createdBy": "System",
    "recipients": [
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-07-07T10:23:17.291Z",
    "status": "Ready",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "Low",
    "numberOfCopies": 1,
    "id": "cbfe5689-b45c-4f3a-b155-99dc1126bb5b",
    "name": "ValidateSourceLiquidOrder",
    "description": "validate source order",
    "createdBy": "Jason",
    "recipients": [
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-09-20T08:24:02.711Z",
    "status": "Released",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "High",
    "numberOfCopies": 1,
    "id": "559f3024-3da1-4828-b489-50de77492318",
    "name": "Neat order",
    "description": "neat order",
    "createdBy": "System",
```

```
      "recipients": [
        "success@simulator.amazonses.com"
      ],
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:17.850Z",
      "status": "Ready",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
      "tags": [],
      "priority": "Medium",
      "numberOfCopies": 1,
      "id": "be1c20e4-bcda-47f2-85bb-3876caca02ea",
      "name": "Big Order 1",
      "description": "Transfer from rack to plate",
      "createdBy": "System",
      "recipients": [
        "success@simulator.amazonses.com"
      ],
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:16.602Z",
      "status": "Released",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
      "tags": [],
      "priority": "Low",
      "numberOfCopies": 1,
      "id": "1de156d2-23ee-46bc-ae7f-f55ee51cd57c",
      "name": "Star Only + Reference + Dilution Series",
      "description": "Order with references and dilution series",
      "createdBy": "System",
      "recipients": [
        "success@simulator.amazonses.com"
      ],
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:15.574Z",
      "status": "Ready",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
      "tags": [],
      "priority": "High",
      "numberOfCopies": 1,
      "id": "7e2faf5d-9c9b-4c64-b53f-2e5a68d03abf",
      "name": "Test Order 4",
      "description": "Transfer SourceTubes from ManStore to Plate",
```

```
    "createdBy": "System",
    "recipients": [
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-07-07T10:23:14.958Z",
    "status": "Ready",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "Low",
    "numberOfCopies": 1,
    "id": "763af6b5-e826-4517-9722-722faf95a1e3",
    "name": "Star-Bravo + Reference",
    "description": "Order with references",
    "createdBy": "System",
    "recipients": [
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-07-07T10:23:15.783Z",
    "status": "Ready",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "Low",
    "numberOfCopies": 1,
    "id": "f9c84719-1390-4ee8-b7c9-9471ca102d5b",
    "name": "New Order 3",
    "description": "Sources on plates 2",
    "createdBy": "System",
    "recipients": [
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-07-07T10:23:15.392Z",
    "status": "Ready",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "High",
    "numberOfCopies": 1,
    "id": "08626ce9-6f5c-40a8-9b50-97986198456a",
    "name": "Test Order",
```

```
    "description": "Transfer SourceTube to Plate",
    "createdBy": "System",
    "recipients": [
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-07-07T10:23:14.421Z",
    "status": "No path",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "High",
    "numberOfCopies": 1,
    "id": "cb25deb0-8f0a-4be0-aedb-492741b02bd6",
    "name": "Test Order 2",
    "description": "Transfer SourceTube to Plate",
    "createdBy": "System",
    "recipients": [
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-07-07T10:23:14.617Z",
    "status": "Ready",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "Low",
    "numberOfCopies": 1,
    "id": "def1c6e5-5b4e-459d-a4ab-e8a27800e2d9",
    "name": "Star Only + different volumes and concentrations",
    "description": "Order with references and dilution series",
    "createdBy": "System",
    "recipients": [
      "success@simulator.amazonses.com"
    ],
    "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
    "receivedAt": "2022-07-07T10:23:16.126Z",
    "status": "Ready",
    "hasStartedJobs": false,
    "allLineItemsHaveDeliverable": false
  },
  {
    "tags": [],
    "priority": "High",
    "numberOfCopies": 1,
    "id": "2764a14a-fbaa-4108-a8a7-b32ef73661ac",
```

```
      "name": "Echo order (no ACI)",
      "description": "Dilute from intermediate order that doesn't
require an ACI",
      "createdBy": "System",
      "recipients": [
        "success@simulator.amazonses.com"
      ],
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:17.557Z",
      "status": "Ready",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
      "tags": [],
      "priority": "Low",
      "numberOfCopies": 1,
      "id": "cb7c43f9-aa97-44b3-80f4-7d4212568e90",
      "name": "Split Neat 0014",
      "description": "order for split neat job",
      "createdBy": "System",
      "recipients": [
        "success@simulator.amazonses.com",
        "jimmy@hendrix.org",
        "alpha@centauri.net"
      ],
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:15.209Z",
      "status": "Released",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
      "tags": [],
      "priority": "High",
      "numberOfCopies": 1,
      "id": "de7c0537-ba3b-463d-b70e-b57495cd7280",
      "name": "No Path Order",
      "description": "To be tested with miracle run",
      "createdBy": "System",
      "recipients": [
        "success@simulator.amazonses.com"
      ],
      "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
      "receivedAt": "2022-07-07T10:23:17.421Z",
      "status": "No path",
      "hasStartedJobs": false,
      "allLineItemsHaveDeliverable": false
    },
    {
```

```
        "tags": [],
        "priority": "Low",
        "numberOfCopies": 1,
        "id": "4c824bf2-27b8-40a8-82da-6c92debd4071",
        "name": "Star-Echo + Reference",
        "description": "Star Echo Order with references",
        "createdBy": "System",
        "recipients": [
          "success@simulator.amazonses.com"
        ],
        "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
        "receivedAt": "2022-07-07T10:23:15.940Z",
        "status": "Ready",
        "hasStartedJobs": false,
        "allLineItemsHaveDeliverable": false
      },
      {
        "tags": [],
        "priority": "High",
        "numberOfCopies": 1,
        "id": "aa20d3bb-9f2b-4fc7-bc58-af20eb64ea4a",
        "name": "Serialization order (wrapped dilution series)",
        "description": "order that has a dilution series wrapped around
two rows",
        "createdBy": "System",
        "recipients": [
          "success@simulator.amazonses.com"
        ],
        "recipientAddress": "Spinnereistraße 7, 95445 Bayreuth",
        "receivedAt": "2022-07-07T10:23:17.679Z",
        "status": "Ready",
        "hasStartedJobs": false,
        "allLineItemsHaveDeliverable": false
      }
    ]
  }
```


**Create Order**

- Method
  - POST
- lab-operations/{lab}/orders

The `orders` endpoint allows you to create a structured request that defines a material sample to be processed by Lab Operations.

Objects can be specified individually or batch. Object parameters that can be applied to an order specification are described in the following table.

| # | Parameter | Parent | Type/ | Example |
|---|---|---|---|---|
| 1 | `id` | - | string | `o1z2GaZzKuS3s5cX6npsKD` |
| 2 | `name` | - | string | `test 1` |

| | | | | |
|---|---|---|---|---|
| 3 | description | - | string | an order |
| 4 | createdBy | - | string | userID? |
| 5 | createdAt | - | date | 2022-11-11T16:14:43.692Z |
| 6 | updatedBy | - | string | - |
| 7 | updatedAt | - | date | 2022-11-11T16:14:43.692Z |
| 8 | attachments | - | **object** | - |
| 9 | tags | - | array | november |
| 10 | comments | - | **object (array)** | [] |
| 11 | recipients | - | **object (array)** | success@simulator.amazonses.com |
| 12 | recipients address | - | string | Spinnereistraße 7, 95445 Bayreuth |
| 13 | receivedAt | - | string | 2022-11-11T16:14:43.692Z |
| 14 | format | - | **object** | - |
| 15 | lineItems | - | **object** | - |
| 16 | intermediateFormat | lineItems | **object** | - |
| 17 | sourceInventoryItem | lineItems | **object** | - |
| 18 | orderFragments | - | **object (array)** | - |
| 19 | status | - | date | created |
| 20 | type | - | **object** | Fulfillment |
| 21 | isNotExecutable | - | boolean | true |
| 22 | priority | - | **object** | - |
| 23 | numberOfCopies | - | number | 1 |
| 24 | isLineSequenceRelevant | - | string | false |
| 25 | controlVolume | - | number | 1 |
| 26 | miracleRun | - | **object** | - |
| 26 | message | - | string | requested volume has... |
| 27 | hasStartedJobs | - | boolean | true |
| 28 | allLineItemsHaveDeliverable | - | boolean | true |
| 29 | numberofLineItems | - | number | 0 |
| 30 | numberOfDeliverables | - | number | 1 |
| 31 | dueDate | - | date | 2022-11-17T12:25:55.388Z |

## Create Order Example - JSON Format

createOrders JSON Format


```
{
  "id": "string",
  "name": "string",
  "description": "string",
  "createdBy": "string",
  "createdAt": "2022-11-17T12:25:55.387Z",
  "updatedBy": "string",
  "updatedAt": "2022-11-17T12:25:55.387Z",
  "attachments": [
    {
```

```
      "id": "string",
      "name": "string",
      "previewEnabled": true,
      "role": {},
      "size": 0,
      "mimeType": "string",
      "payload": {}
    }
  ],
  "tags": [
    "string"
  ],
  "comments": [
    {
      "id": "string",
      "value": "string",
      "timestamp": "2022-11-17T12:25:55.388Z",
      "userDisplayName": "string"
    }
  ],
  "recipients": [
    "string"
  ],
  "recipientAddress": "string",
  "receivedAt": "2022-11-17T12:25:55.388Z",
  "format": {
    "id": "string",
    "name": "string",
    "targetContainerType": "string",
    "targetBarcode": "string",
    "targetAmount": 0,
    "materialState": {},
    "wellVectors": [
      {
        "id": "string",
        "instanceNumber": 0,
        "type": {},
        "index": 0,
        "start": {
          "row": 0,
          "column": 0
        },
        "wells": 0,
        "direction": {},
        "spacing": 0
      }
    ],
    "dilutionSeries": [
      null
    ],
```

```
      "rows": 0,
      "columns": 0
    },
    "lineItems": [
      {
        "id": "string",
        "status": "string",
        "amount": 0,
        "topConcentration": 0,
        "recipients": [
          "string"
        ],
        "recipientAddress": "string",
        "intermediateFormat": {
          "id": "string",
          "name": "string",
          "targetContainerType": "string",
          "targetBarcode": "string",
          "targetAmount": 0,
          "materialState": {},
          "wellVectors": [
            {
              "id": "string",
              "instanceNumber": 0,
              "type": {},
              "index": 0,
              "start": {
                "row": 0,
                "column": 0
              },
              "wells": 0,
              "direction": {},
              "spacing": 0
            }
          ],
          "dilutionSeries": [
            null
          ],
          "rows": 0,
          "columns": 0
        },
        "sourceInventoryItem": {
          "sampleId": "string",
          "containerBarcode": "string",
          "location": {
            "id": "string",
            "displayName": "string",
            "type": {},
            "parentId": "string",
            "barcode": "string",
```

```
          "capacity": 0,
          "layout": [
            "string"
          ],
          "orientation": {},
          "countingDirection": {},
          "loadingSequence": {},
          "children": [
            "string"
          ],
          "locationTree": [
            "string"
          ],
          "hidden": true,
          "allowHazardous": true,
          "allowControlled": true
        },
        "position": {
          "row": 0,
          "column": 0
        }
      },
      "comment": "string",
      "layoutIndex": 0,
      "deliveryIndex": 0,
      "externalReferences": [
        "string"
      ],
      "sourceType": {},
      "deliverableSampleId": "string"
    }
  ],
  "orderFragments": [
    {
      "id": "string",
      "order": {
        "id": "string",
        "name": "string",
        "type": {},
        "description": "string",
        "recipients": [
          "string"
        ],
        "priority": {},
        "receivedAt": "2022-11-17T12:25:55.388Z",
        "recipientAddress": "string",
        "numberOfCopies": {},
        "isLineItemSequenceRelevant": true
      },
      "lineItems": [
```

```
{
  "id": "string",
  "status": "string",
  "amount": 0,
  "topConcentration": 0,
  "recipients": [
    "string"
  ],
  "recipientAddress": "string",
  "intermediateFormat": {
    "id": "string",
    "name": "string",
    "targetContainerType": "string",
    "targetBarcode": "string",
    "targetAmount": 0,
    "materialState": {},
    "wellVectors": [
      {
        "id": "string",
        "instanceNumber": 0,
        "type": {},
        "index": 0,
        "start": {
          "row": 0,
          "column": 0
        },
        "wells": 0,
        "direction": {},
        "spacing": 0
      }
    ],
    "dilutionSeries": [
      null
    ],
    "rows": 0,
    "columns": 0
  },
  "sourceInventoryItem": {
    "sampleId": "string",
    "containerBarcode": "string",
    "location": {
      "id": "string",
      "displayName": "string",
      "type": {},
      "parentId": "string",
      "barcode": "string",
      "capacity": 0,
      "layout": [
        "string"
      ],
```

```
              "orientation": {},
              "countingDirection": {},
              "loadingSequence": {},
              "children": [
                "string"
              ],
              "locationTree": [
                "string"
              ],
              "hidden": true,
              "allowHazardous": true,
              "allowControlled": true
            },
            "position": {
              "row": 0,
              "column": 0
            }
          },
          "comment": "string",
          "layoutIndex": 0,
          "deliveryIndex": 0,
          "externalReferences": [
            "string"
          ],
          "sourceType": {},
          "deliverableSampleId": "string"
        }
      ],
      "selectedPath": {
        "consumed": 0,
        "effort": 0,
        "runs": [
          "string"
        ],
        "strategy": {}
      }
    }
  ],
  "status": "string",
  "type": "Fulfillment",
  "isNotExecutable": true,
  "priority": {},
  "numberOfCopies": {},
  "isLineItemSequenceRelevant": true,
  "controlVolume": 0,
  "miracleRun": {
    "id": "string",
    "orderId": "string",
    "format": {
      "id": "string",
```

```
        "name": "string",
        "targetContainerType": "string",
        "targetBarcode": "string",
        "targetAmount": 0,
        "materialState": {},
        "wellVectors": [
          {
            "id": "string",
            "instanceNumber": 0,
            "type": {},
            "index": 0,
            "start": {
              "row": 0,
              "column": 0
            },
            "wells": 0,
            "direction": {},
            "spacing": 0
          }
        ],
        "dilutionSeries": [
          null
        ],
        "rows": 0,
        "columns": 0
      },
      "amount": 0,
      "topConcentration": 0,
      "equipments": [
        "string"
      ],
      "instructions": "string"
    },
    "message": "string",
    "hasStartedJobs": true,
    "allLineItemsHaveDeliverable": true,
    "numberOfLineItems": 0,
    "numberOfDeliverables": 0,
    "dueDate": "2022-11-17T12:25:55.388Z"
  }
```


#### Create Orders - batch

- Method
  - POST
- `/lab-operations/{lab}/orders/create-many`

The `create-many` endpoint allows you to *batch* create structured requests that define material samples to be processed by Lab Operations.

#### Cancel Orders

- Method
  - DELETE (PUT?)
- `/lab-operations/{lab}/orders/cancelation`

The `cancelation` endpoint allows you to cancel (delete) order by `id` in the Lab Operations database.

#### Reset Orders

- Method
  - PUT
- `/lab-operations/{lab}/orders/reset`

The `reset` endpoint allows you to reset an order by `id` to its original status in the Lab Operations database.

#### Complete Orders

- Method
  - PUT

`/lab-operations/{lab}/orders/completion`

The `complete` endpoint allows you to *batch* complete orders by `id` in bulk in the Lab Operations database.

#### Update Order

- Method
  - PUT

`/lab-operations/{lab}/orders/{id}`

The `{id}` endpoint allows you to update the order directly in the Lab Operations database.

---

#### Order Objects

### attachment

The `attachment` object is a container for images and document components of the order. These items can be included with the order from the request system or directly uploaded from a network or local machine.

| # | Parameter | Parent | Type/ Reference | Example |
|---|---|---|---|---|
| 1 | `attachments` | - | **object (array)** | - |
| 2 | `id` | attachments | string | - |
| 3 | `name` | attachments | string | - |
| 4 | `previewEnabled` | attachments | boolean | `true` |
| 5 | `role` | attachments | **object** | - |
| 6 | `size` | attachments | number | `0` |
| 7 | `mimeType` | attachments | string | - |
| 8 | `payload` | attachments | **object** | - |

### comments

The `comments` object is a container for a string displayed on the interface intended as instructions or information for the operator regarding the order. This item can be included with the order from the request system or directly uploaded from a network or local machine.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | `comments` | - | **object (array)** | `[]` |
| 2 | `id` | comments | string | - |

| | | | | |
|---|---|---|---|---|
| 3 | value | comments | string | - |
| 4 | timestamp | comments | date | 2022-11-11T16:14:43.692Z |
| 5 | userDisplayName | comments | string | - |

## recipients

The `recipients` parameter is a string that contains the email address or name of a person or entity for whom the complete processed order is transferred. The `recipientAddress` is typically the physical address applied to the shipping label. The recipient is also informed in some configurations when certain process steps are complete.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | recipients | - | string (array) | john.doe@assayLab.com |
| 2 | recipientAddress | - | string | Spinnereistraße 7, 95445 Bayreuth |
| 3 | receivedAt | - | string | 2022-11-11T16:14:43.692Z |

## format

The `format` object specifies the definition or description of the form or characteristics the material should be provided (e.g. to fulfill the order) and represents a(n arbitrary) definition of sample characteristics. The values for the attributes serve as a template from which the resulting material sample(s) in the order typically deviate.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | format | - | **object** | - |
| 2 | id | format | string | - |
| 3 | name | format | string | Cypress Format |
| 4 | targetContainerType | format | string | GR384 |
| 5 | targetBarcode | format | string | - |
| 6 | targetAmount | format | number | - |
| 7 | materialState | format | object | Liquid |
| 8 | wellVectors | format | **object (array)** | ? |
| 9 | id | wellVectors | string | - |
| 10 | instanceNumber | wellVectors | number | 0 |
| 11 | type | wellVectors | string | Sample |
| 12 | index | wellVectors | number | ? |
| 13 | start | **wellVectors** | **object** | - |
| 14 | row | start | number | 0 |
| 15 | column | start | number | 0 |
| 16 | wells | wellVectors | number | 1 |
| 17 | direction | wellVectors | string | East |
| 18 | spacing | wellVectors | number | 0 |
| 19 | dilutionSeries | wellVectors | array | [] |
| 20 | rows | wellVectors | number | 16 |
| 21 | columns | wellVectors | number | 24 |

## lineItems

The `lineItems` object breaks a single order down into its component parts and recipients (for notification and/or shipping purposes). `lineItems` determine the parts of an order (expressed as the resulting material sample) that must be processed together and therein attributes.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | lineItems | - | **object** | - |
| 2 | id | lineItems | string | - |
| 3 | status | lineItems | string | - |
| 4 | amount | lineItems | number | 0 |
| 5 | topConcentration | lineItems | number | - |
| 6 | recipients | lineItems | array | - |
| 7 | recipientAddress | lineItems | string | - |

## intermediateFormat

The `intermediateFormat` object is identical to the standard `format` in that it represents the set of characteristics that define the material sample. The difference is that this object enables the material sample final result to be processed in fragments or separate parts.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | intermediateFormat | lineItems | **object-format (array)** | - |
| 2 | id | intermediateFormat | string | - |
| 3 | name | intermediateFormat | string | - |
| 4 | targetContainertype | intermediateFormat | string | - |
| 5 | targetBarcode | intermediateFormat | string | - |
| 6 | targetAmount | intermediateFormat | number | - |
| 7 | materialState | intermediateFormat | **object** | - |

## comment

The `comment` parameter differs from the `comments` object in that it is a string and is a child parameter of `lineItem`.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | comment | lineItems | string | - |
| 2 | layoutIndex | lineItems | number | 0 |
| 3 | deliveryIndex | lineItems | number | 0 |
| 4 | externalReferences | lineItems | string (array) | - |
| 5 | sourceType | lineItems | **object** | - |
| 6 | deliverableSampleID | lineItems | string | - |

## miracleRun

The `miracleRun` object specifies sample management processing using an intermediate format template.

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | miracleRun | - | **object** | - |
| 2 | id | miracleRun | string | - |
| 3 | orderID | miracleRun | string | - |
| 4 | format | miracleRun | **object** | - |
| 5 | wellVectors | format | **object** | - |
| 6 | amount | miracleRun | string | 0 |
| 7 | topConcentration | miracleRun | string | 0 |
| 8 | equipments | miracleRun | array[string] | - |
| 9 | instructions | miracleRun | string | - |

**Nested Attributes**

The following objects and parameters specify sample management logic specific to Lab Operations.

## wellVectors

The wellVectors object is a `format` attribute that specifies the starting point, type, direction, spacing and an index of the format layout.
Can be a child of format, IntermediateFormat

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | `wellVectors` | **intermediateFormat** | **object (array)** | - |
| 2 | `id` | wellVectors | string | - |
| 3 | `instanceNumber` | wellVectors | number | - |
| 4 | `type` | wellVectors | **object** | - |
| 5 | `index` | wellVectors | number | - |
| 6 | `start` | **wellVectors** | **object** | - |
| 7 | `row` | start | number | - |
| 8 | `column` | start | number | - |
| 9 | `wells` | wellVectors | number | - |
| 10 | `direction` | wellVectors | **object** | - |
| 11 | `spacing` | wellVectors | number | - |
| 12 | `dilutionSeries` | intermediateFormat | array | `[null]` |
| 13 | `rows` | intermediateFormat | number | `16` |
| 14 | `columns` | intermediateFormat | number | `24` |

## sourceInventoryItems

The `sourceInventoryItems` object identifies the material sample in the lab inventory, including the attributes `containerBarcode`, `displayName`, `capacity`, hazard flags, `parentID` and `children` among others.
Child of lineItems

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | `sourceInventoryItem` | lineItems | **object** | - |
| 2 | `sampleID` | sourceInventoryItem | string | - |
| 3 | `containerBarode` | sourceInventoryItem | string | - |
| 4 | `location` | sourceInventoryItem | **object** | - |
| 5 | `id` | location | string | - |
| 6 | `displayName` | location | string | - |
| 7 | `type` | location | **object** | - |
| 8 | `parentId` | location | string | - |
| 9 | `barcode` | location | string | - |
| 10 | `capacity` | location | number | `0` |
| 11 | `layout` | location | array[string] | - |
| 12 | `orientation` | location | object | - |
| 13 | `counting direction` | location | object | - |
| 14 | `loadingSequence` | location | object | - |
| 15 | `children` | location | array | - |
| 16 | `locationTree` | location | array | - |
| 17 | `hidden` | location | boolean | `true` |

| | | | | |
|---|---|---|---|---|
| 18 | `allowHazardous` | location | boolean | `true` |
| 19 | `allowControlled` | location | boolean | `true` |
| 20 | `position` | sourceInventoryItem | **object** | - |
| 21 | `row` | sourceInventoryItem | number | `0` |
| 22 | `column` | sourceInventoryItem | number | `0` |

## orderFragments

The `orderFragmentation` object is an order segment as a job item. This job item is processed using the rummage table.

[3] The parameter `isLineItemSequenceRelevent` is a boolean data type that is typically nested within an order as an attribute of an `orderFragment`. It can also exist outside of the `orderFragment` parameter.

Can be a child of lineItems

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | `orderFragments` | - | **object (array)** | - |
| 2 | `id` | orderFragments | string | - |
| 3 | `order` | **orderFragments** | **object** | - |
| 4 | `id` | order | string | - |
| 5 | `name` | order | string | - |
| 6 | `type` | order | object | - |
| 7 | `description` | order | string | - |
| 8 | `recipients` | order | array[string] | - |
| 9 | `priority` | order | object | - |
| 10 | `receivedAt` | order | date | `2022-11-21T12:09:44.800Z` |
| 11 | `recipientAddress` | order | string | - |
| 12 | `numberOfCopies` | order | object | - |
| 13 | [3]`isLineItemSequenceRelevent` | order | boolean | `true` |

## selectedPath

The `selectedPath` object specifies the processing path (equipment, process, format and job items) selected for the sample management processing sequence.

Child of orderFragments

| # | Parameter | Parent | Type | Example |
|---|---|---|---|---|
| 1 | `selectedPath` | orderFragments | **object** | - |
| 2 | `consumed` | selectedPath | number | `0` |
| 3 | `effort` | selectedPath | number | `0` |
| 4 | `runs` | selectedPath | array[string] | - |
| 5 | `strategy` | selectedPath | object | - |