**API and Documentation \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

In washMaster Back-End we use the standard HTTP/1.1 methods ([RFC-2616](https://tools.ietf.org/html/rfc2616)), such as GET and POST to send JSON objects in request bodies with GET semantics.

**JSON Request Body**

parameters should be set as a key-value pair of the JSON object in the HTTP request body. The API server accepts both UTF-8 encoded bytes and standard-compliant Unicode-escaped strings in the body.

The API responses always contain a root JSON object.

This documentation uses a type annotation style,the common types are array (JSON array), object (JSON object), int (integer-only subset of JSON number), str (JSON string), and bool (JSON true or false).

Optional values may be omitted or set to null or 0.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Planning Phase \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**\*Get Previous cargos**

**http://** **194.103.55.106:3003/api/** **previousCargos (get)**

[

    {

        "cargo\_id": 1,

        "cargo\_previous\_name": "Naphtha / Clean Condensates / LDF"

    },

    {

        "cargo\_id": 2,

        "cargo\_previous\_name": "Avgas"

    },

    Etc..

]

**\*Get next cargos to be loaded**

\***http:// 194.103.55.106:3003/api/ cargosToBeLoaded (get)**

List of cargos will be fetched from db.

[

    {

        "cargo\_loaded\_id": 1,

        "cargo\_load\_name": "Naphtha / Clean Condensates / LDF"

    },

    {

        "cargo\_loaded\_id": 2,

        "cargo\_load\_name": "Avgas"

    },

    {

        "cargo\_loaded\_id": 3,

        "cargo\_load\_name": "MTBE"

    },

    {

        "cargo\_loaded\_id": 4,

        "cargo\_load\_name": "Ethanol/Methanol"

    },

]

**\*Get Cleaning instructions**

**\*http:// 194.103.55.106:3003/api/getCleaningInstructions (post)**

- Object to be sent with the request:

{

"cargo\_id": 10,

"cargo\_loaded\_id":12

}

Get wash instructions according to for example BP Tank Cleaning Guide.

{

    "cleaning\_guide\_id": 318,

    "cargo\_id": 10,

    "cargo\_loaded\_id": 15,

    "cargo\_load\_name": "Sulphur Free Diesel",

    "cargo\_previous\_name": "Kerosenes (undyed)",

    "LUB": null,

    "M": null,

    "method": "Wash tanks with COLD sea water until tank is clean Refer Notes 1, 2 & 3",

    "notes": "1. Tanks to be stripped dry such that any liquid ROB is confined to the pump well - or better.2. Pump columns, deck lines, drops etc are to be blown clear and drained free of all product and water.3. Deck lines, loading drops and cross over lines must be thoroughly washed and drained.",

    "P": null,

    "X": null,

    "S": "Tanks that have been washed for the carriage of these products must have a final wash with fresh water.Tank and lines are then to be blown and drained free of water"

}

**\*Capacity Data \*\*\***

**\*Get Machines names.**

**http://** **194.103.55.106:3003/api/getCapacityMachinesNames (get)**

Front end will have list of Machines names that conducting wash operations.

[

    "pj120\_capacity\_data",

    "pj15\_capacity\_data",

    "pj25\_capacity\_data",

    "pj30\_capacity\_data"

]

**\*Get Capacity data for a specific Machine.**

* **http:// 194.103.55.106:3003/api/getCapacityDataForMachine (post)**

Get capacity data for a specific machine

- Object to be sent with the request:

{

"machineName":"pj15\_capacity\_data"

}

Response wil be list of throughputs cubic metres per hour:

[

    {

        "pj15\_capacity\_id": 1,

        "bar": 6,

        "nozzle\_diameter\_8\_throughput": 3.5,

        "nozzle\_diameter\_9\_throughput": 5.5,

        "nozzle\_diameter\_10\_throughput": 8,

        "nozzle\_diameter\_12\_throughput": 12,

        "nozzle\_diameter\_13\_throughput": 15,

        "nozzle\_diameter\_14\_throughput": 18,

        "nozzle\_diameter\_16\_throughput": 24

    },

    {

        "pj15\_capacity\_id": 2,

        "bar": 7,

        "nozzle\_diameter\_8\_throughput": 4,

        "nozzle\_diameter\_9\_throughput": 6,

        "nozzle\_diameter\_10\_throughput": 9,

        "nozzle\_diameter\_12\_throughput": 13,

        "nozzle\_diameter\_13\_throughput": 16,

        "nozzle\_diameter\_14\_throughput": 19.5,

        "nozzle\_diameter\_16\_throughput": 25.5

    },

    Etc …}]

**\* Capacity data for a specific Machine and pressure.**

* **http:// 194.103.55.106:3003/api/getCapacityDataForBar (post)**

Get capacity data for a specific machine and pressure (bar)

- Object to be sent with the request:

{

"machineName":"pj25\_capacity\_data",

"bar": 6.5

}

Response wil be object of throughputs for pressure defined in the request cubic metres per hour:

{

    "nozzle\_diameter\_8\_throughput": 6.25,

    "nozzle\_diameter\_9\_throughput": 12.5,

    "nozzle\_diameter\_10\_throughput": 19.75,

    "nozzle\_diameter\_12\_throughput": 23.75,

    "nozzle\_diameter\_14\_throughput": 38.25,

    "nozzle\_diameter\_16\_throughput": 47.5

}

**\* Get wash types and ids.**

In this api front end will get names and ids of predefined wash modes .

* **http:// 194.103.55.106:3003/api/getWashTypeIdsNames(get)**

[

    {

        "washType": 1,

        "wash\_mode\_name": "Manual wash"

    },

    {

        "washType": 2,

        "wash\_mode\_name": "Average cleaning 1"

    },

    {

        "washType": 3,

        "wash\_mode\_name": "Average cleaning 2"

    }, etc ..}]

**\* Get a predefined wash modes value.**

* **http:// 194.103.55.106:3003/api/getWashMode(post)**
* - Object to be sent with the request:

{

"washType":4 ,

"speed":0,

"washingSector":0,

"desiredTime":100,

"bar":6.5,

"machineName":"pj30\_capacity\_data",

"numberOfMachines":2,

"nozzle\_diameter":"nozzle\_diameter\_24\_throughput"

}

From above api front end can fetch Predefined wash mode and cleaning time accordingly.

OBS: The settings of parameters is optional if 0 provided the default setting value will sent as response.However, some params required therefore above object must be provided in post request.

If a user specifies time for washing step for example, this time will override recommended time that will be calculated from wash mode, other wise recommended cleaning time will be sent to front end.

The list below shows numbers of predefined washing modes with its default values.

washType 1: Manual wash

washType 2: Average cleaning1

washType3: Average cleaning2

washType4:LightCleaning1

washType 5: LightCleaning2

washType 6: Bottom cleaning mode

washType 7: Heavy cleaning mode

(In this mode wash sector must be provided by user)

washType 8: pre-wash mode

washType 9: Bottom wash mode (pj 120 machine)

washType 10: Middle wash mode (pj 120 machine)

washType 11: Full wash mode (pj 120 machine)

**washType 1:**

**'Manual wash**

**washType 2:**

**Average cleaning 1**

**pitch = 1.5;**

**speed = 2;**

**washingSector = 135;**

**washType 3:**

**Average cleaning 2**

**pitch = 1.5;**

**speed = 2;**

**washingSector = 180;**

**washType 4:**

**Light cleaning 1**

**pitch = 1.5;**

**speed = 2;**

**washObject.washingSector = 135/2;**

**washType 5:**

**Light cleaning 2**

**pitch = 1.5;**

**speed = 2;**

**washingSector = 180/2;**

**washType 6:**

**Bottom cleaning**

**pitch = 1.5;**

**speed = 2;**

**washingSector = 45;**

**washType 7:**

**Heavy cleaning**

**pitch = 3;**

**speed = 1;**

**washingSector = provided by user;**

**washType 8:**

**Pre-wash**

**pitch = 3;**

**speed = 2;**

**washingSector = 180;**

**washType 9:**

**Bottom-wash (pj 120 machine)**

**pitch = 3;**

**speed = 1;**

**washingSector = 40;**

**washType 10:**

**Middle-wash (pj 120 machine).**

**pitch = 3;**

**speed = 1;**

**washingSector = 120;**

**washType 11:**

**Full-wash (pj 120 machine)**

**washObject.pitch = 3;**

**washObject.speed = 1;**

**washingSector = 180;**

Response will be the following objects:

{

    "washType": 4,

    "wash\_mode\_name": "Light cleaning 1",

    "cleaning\_machine\_name": "POLAR JET® PJ 30",

    "washing\_sector": 135,

    "lower\_washing\_sector": 0,

    "upper\_washing\_sector": 135,

    "speed": 2,

    "pitch": 1.5,

    "cleaning\_time\_in\_Minutes": 100,

    "full\_cycle": true,

    "number\_of\_cycles": 1.11,

    "nozzle\_diameter\_24\_throughput Capacity": 49,

    "washing\_Media\_Amount": {

        "nozzle\_diameter\_24\_throughput for 1.67 hours": "81.67"

    }

}

Washing media amount will be measured in **Cubic Meter Per Hour** (m3/h)

**\* Get a list of wash type and wash modes ids and names.**

* **http:// 194.103.55.106:3003/api/ getWashTypeIdsNames (get)**

The list below has numbers of objects each object has washType and wash mode name.

[

{

"washType": 1,

"wash\_mode\_name": "Manuel wash"

},

{

"washType": 2,

"wash\_mode\_name": "Average cleaning 1"

}, …etc]

**\* Get a list of tanks configuration .**

* **http:// 194.103.55.106:3003/api/getTankInfo (get)**

[

{

"tankId": 1,

"tcmId": 1,

"tankName": "CT1P",

"machine\_char": "a",

"nozzle\_diameter": "nozzle\_diameter\_28\_throughput",

"machineName": "pj120\_capacity\_data"

},

{

"tankId": 1,

"tcmId": 2,

"tankName": "CT1P",

"machine\_char": "b",

"nozzle\_diameter": "nozzle\_diameter\_28\_throughput",

"machineName": "pj120\_capacity\_data"

},

{

"tankId": 2,

"tcmId": 3,

"tankName": "CT1S",

"machine\_char": "a",

"nozzle\_diameter": "nozzle\_diameter\_29\_throughput",

"machineName": "pj120\_capacity\_data"

},

{

"tankId": 2,

"tcmId": 4,

"tankName": "CT1S",

"machine\_char": "b",

"nozzle\_diameter": "nozzle\_diameter\_29\_throughput",

"machineName": "pj120\_capacity\_data"

},

{

"tankId": 3,

"tcmId": 5,

"tankName": "CT2P",

"machine\_char": "a",

"nozzle\_diameter": "nozzle\_diameter\_30\_throughput",

"machineName": "pj120\_capacity\_data"

},

{

"tankId": 3,

"tcmId": 6,

"tankName": "CT2P",

"machine\_char": "b",

"nozzle\_diameter": "nozzle\_diameter\_30\_throughput",

"machineName": "pj120\_capacity\_data"

},

{

"tankId": 4,

"tcmId": 7,

"tankName": "CT2S",

"machine\_char": "a",

"nozzle\_diameter": "nozzle\_diameter\_31\_throughput",

"machineName": "pj120\_capacity\_data"

},

{

"tankId": 4,

"tcmId": 8,

"tankName": "CT2S",

"machine\_char": "b",

"nozzle\_diameter": "nozzle\_diameter\_31\_throughput",

"machineName": "pj120\_capacity\_data"

}

]

**\* Submit ageneral plan .**

* **http:// 194.103.55.106:3003/api/submitPlan (post)**

Object to be included with the request as follows:

{

  "generalInfo": {

    "vesselName": "Mafuta - Verolme",

    "planID": "123",

    "voyageId": "123",

    "nextLoadPort": "Malmo",

    "sequenceOfWashing": "CT1P,CT1s,CT2P,CT2P",

    "positionOfTankCleaning": "Fixed",

    "manualLocation": "Dayton",

    "genInfoDate": "2020-08-03",

    "genInfoTime": "07:39 PM",

    "machineName": "pj15\_capacity\_data",

    "nozzle\_diameter": "nozzle\_diameter\_12\_throughput",

    "userName": "John"

  },

  "tanks": [

    {

      "tankId": 1,

      "cleaningMethod": "Charterers",

      "previousCargo": "Naphtha / Clean Condensates / LDF",

      "nextCargo": "Naphtha / Clean Condensates / LDF",

      "cleaningMethod2": 5,

      "hcLabel":"lel",

      "nextMarpol":"false,true",

      "previousMarpol": "true,false",

      "stepsCtr": 2,

      "tankCoating": "1",

      "tankAtmosphere": "1",

      "oxygenLevel": 2.5,

      "hc": 500.8,

      "tcmIda": 1,

      "tcmIdb": 0,

      "tankComments": "32",

      "steps": [

        {

          "stepProfile": 1,

          "stepNumber": 1,

          "timeForOperation": 60,

          "step\_profile\_name": "pre-Clean Flushing",

          "washingMedia2":1,

          "comments":"Add more oil next time "

        },

        {

          "stepProfile": 4,

          "step\_profile\_name": "Tank wash",

          "stepNumber": 2,

          "washingMedia": 5,

          "washingMedia2":2,

          "comments":"Add more water next time",

          "lWsValue": 45,

          "uWsValue": 135,

          "cleaning\_time\_in\_minutes": 12,

          "rpm": 1,

          "bar": 8,

          "speed": 2,

          "pitch": 1.5,

          "washType": 1

        }

      ]

    },

    {

      "tankId": 3,

      "cleaningMethod": "Recommended",

      "previousCargo": "Naphtha / Clean Condensates / LDF",

      "nextCargo": "Light Fuel Oil (LFO)",

      "hcLabel":"lel",

      "stepsCtr": 1,

      "tankCoating": "1",

      "tankAtmosphere": "1",

      "numberOfMachines":1,

      "oxygenLevel": 5,

      "hc": 400,

      "tcmIda": 0,

      "tcmIdb": 6,

      "tankComments": "Clear blabal to get blaabla",

      "steps": [

        {

          "stepProfile": 4,

          "step\_profile\_name": "Tank wash",

          "stepNumber": 1,

          "washingMedia":4,

          "lWsValue": 33,

          "uWsValue": 140,

          "cleaning\_time\_in\_minutes": 60,

          "speed": 2,

          "pitch": 7,

          "rpm": 1,

          "bar": 6,

          "washType": 1

        }

      ]

    },

    {

      "tankId": 11,

      "cleaningMethod": "Charterers",

      "previousCargo": "Unleaded Motor Spirit",

       "nextCargo": "Dyed Gas Oil",

      "hcLabel":"lel",

      "numberOfMachines":2,

      "stepsCtr": 3,

      "tankCoating": "1",

      "tankAtmosphere": "1",

      "oxygenLevel": 2.5,

      "hc": 300,

      "tcmIda": 21,

      "tcmIdb": 22,

      "tankComments": "Add something to clean up blablalba",

      "steps": [

        {

          "stepProfile": 2,

          "stepNumber": 1,

          "timeForOperation": 50,

          "step\_profile\_name": "NZ Purge",

           "washingMedia2":3,

          "comments":"Add more fruit next time"

        },

        {

          "stepProfile": 3,

          "stepNumber": 2,

          "timeForOperation": 20,

          "step\_profile\_name": "Gas Freeing"

        },

        {

          "stepProfile": 4,

          "step\_profile\_name": "Tank wash",

          "stepNumber": 3,

          "washingMedia": 1,

          "lWsValue": 0,

          "uWsValue": 180,

          "cleaning\_time\_in\_minutes": 25,

          "speed": 2,

          "pitch": 3,

          "rpm": 1,

          "bar": 6,

          "washType": 1

        }

      ]

    }

  ]

}

tcmIda or tcmIdb can be omitted by providing 0 values in each parms.That means the machine not used ,but if the machine used tcmId that located in tank information file must be used with tcmIda or tcmIdb (In tank info file there are two chars a and b representing two machins with tcmId)

* In stepProfile 4 we need to get all parms values , bar should be between 6 -12

**\* Get list of general plans ids .**

* **http:// 194.103.55.106:3003/api/generalPlansIds (get)**

[

    {

        "general\_plan\_id": "2020-06-22 06:49:48"

    },

    {

        "general\_plan\_id": "2020-06-22 07:18:44"

    }

]

**\* Get general plan information by general plan id .**

* **http:// 194.103.55.106:3003/api/getGeneralPlan (post)**
* Object to be included with the request with general plan id as follows:

{

        "general\_plan\_id": "2020-06-22 07:18:44"

 }

* Response will be the following object

{

    "tanks": [

        {

            "cleaningMethod2": 5,

            "tankAtmosphere": "1",

            "stepsCtr": 2,

            "tankCoating": "1",

            "cleaningMethod": "Charterers",

            "steps": [

                {

                    "comments": "Add more oil next time ",

                    "step\_profile\_name": "pre-Clean Flushing",

                    "lWsValue": 0,

                    "uWsValue": 0,

                    "speed": 0,

                    "rpm": 0.0,

                    "bar": 0.0,

                    "stepProfile": 1,

                    "washingMedia2": 1,

                    "cleaning\_time\_in\_minutes": 0,

                    "washing\_Media\_Amount": 0.0,

                    "tankId": 1,

                    "stepNumber": 1,

                    "pitch": 0.0,

                    "washingMedia": 0,

                    "timeForOperation": 60

                },

                {

                    "comments": "Add more water next time",

                    "step\_profile\_name": "Tank wash",

                    "lWsValue": 45,

                    "uWsValue": 135,

                    "speed": 2,

                    "rpm": 0.0,

                    "bar": 0.0,

                    "stepProfile": 4,

                    "washingMedia2": 2,

                    "cleaning\_time\_in\_minutes": 12,

                    "washing\_Media\_Amount": 2.8,

                    "tankId": 1,

                    "stepNumber": 2,

                    "pitch": 1.0,

                    "washingMedia": 5,

                    "timeForOperation": 0

                }

            ],

            "previousCargo": "Naphtha / Clean Condensates / LDF",

            "previousMarpol": "true,false",

            "nextCargo": "Naphtha / Clean Condensates / LDF",

            "numberOfMachines": 1,

            "oxygenLevel": 2.5,

            "tankId": 1,

            "hc": 500.8,

            "nextMarpol": "false,true",

            "tcmIdb": 0,

            "tcmIda": 1,

            "tankComments": "32"

        },

        {

            "cleaningMethod2": 0,

            "tankAtmosphere": "1",

            "stepsCtr": 3,

            "tankCoating": "1",

            "cleaningMethod": "Charterers",

            "steps": [

                {

                    "comments": "Add more fruit next time",

                    "step\_profile\_name": "NZ Purge",

                    "lWsValue": 0,

                    "uWsValue": 0,

                    "speed": 0,

                    "rpm": 0.0,

                    "bar": 0.0,

                    "stepProfile": 2,

                    "washingMedia2": 3,

                    "cleaning\_time\_in\_minutes": 0,

                    "washing\_Media\_Amount": 0.0,

                    "tankId": 11,

                    "stepNumber": 1,

                    "pitch": 0.0,

                    "washingMedia": 0,

                    "timeForOperation": 50

                },

                {

                    "comments": null,

                    "step\_profile\_name": "Gas Freeing",

                    "lWsValue": 0,

                    "uWsValue": 0,

                    "speed": 0,

                    "rpm": 0.0,

                    "bar": 0.0,

                    "stepProfile": 3,

                    "washingMedia2": 0,

                    "cleaning\_time\_in\_minutes": 0,

                    "washing\_Media\_Amount": 0.0,

                    "tankId": 11,

                    "stepNumber": 2,

                    "pitch": 0.0,

                    "washingMedia": 0,

                    "timeForOperation": 20

                },

                {

                    "comments": null,

                    "step\_profile\_name": "Tank wash",

                    "lWsValue": 0,

                    "uWsValue": 180,

                    "speed": 2,

                    "rpm": 0.0,

                    "bar": 0.0,

                    "stepProfile": 4,

                    "washingMedia2": 0,

                    "cleaning\_time\_in\_minutes": 25,

                    "washing\_Media\_Amount": 10.08,

                    "tankId": 11,

                    "stepNumber": 3,

                    "pitch": 3.0,

                    "washingMedia": 1,

                    "timeForOperation": 0

                }

            ],

            "previousCargo": "Unleaded Motor Spirit",

            "previousMarpol": null,

            "nextCargo": "Dyed Gas Oil",

            "numberOfMachines": 2,

            "oxygenLevel": 2.5,

            "tankId": 11,

            "hc": 300.0,

            "nextMarpol": null,

            "tcmIdb": 22,

            "tcmIda": 21,

            "tankComments": "Add something to clean up blablalba"

        },

        {

            "cleaningMethod2": 0,

            "tankAtmosphere": "1",

            "stepsCtr": 1,

            "tankCoating": "1",

            "cleaningMethod": "Recommended",

            "steps": [

                {

                    "comments": null,

                    "step\_profile\_name": "Tank wash",

                    "lWsValue": 33,

                    "uWsValue": 140,

                    "speed": 2,

                    "rpm": 0.0,

                    "bar": 0.0,

                    "stepProfile": 4,

                    "washingMedia2": 0,

                    "cleaning\_time\_in\_minutes": 60,

                    "washing\_Media\_Amount": 12.0,

                    "tankId": 3,

                    "stepNumber": 1,

                    "pitch": 7.0,

                    "washingMedia": 4,

                    "timeForOperation": 0

                }

            ],

            "previousCargo": "Naphtha / Clean Condensates / LDF",

            "previousMarpol": null,

            "nextCargo": "Light Fuel Oil (LFO)",

            "numberOfMachines": 1,

            "oxygenLevel": 5.0,

            "tankId": 3,

            "hc": 400.0,

            "nextMarpol": null,

            "tcmIdb": 6,

            "tcmIda": 0,

            "tankComments": "Clear blabal to get blaabla"

        }

    ],

    "generalInfo": {

        "nextLoadPort": "Malmo",

        "sequenceOfWashing": "CT1P,CT1s,CT2P,CT2P",

        "positionOfTankCleaning": "Fixed",

        "userName": "John",

        "nozzle\_diameter": "nozzle\_diameter\_12\_throughput",

        "general\_plan\_id": "2020-09-01 07:33:57",

        "machineName": "pj15\_capacity\_data",

        "manualLocation": "Dayton",

        "genInfoTime": "07:39 PM",

        "planID": "123",

        "voyageId": "123",

        "vesselName": "Mafuta - Verolme",

        "genInfoDate": "2020-08-03"

    }

}

**\* Get manual mode info .**

* **http:// 194.103.55.106:3003/api/getManualWashMode (post)**

{

  "uWsValue":180,

  "lWsValue":0,

  "speed":2,

  "desiredTime":180,

  "pitch":1.5,

  "rpm":2,

  "bar":8.3,

  "machineName":"pj30\_capacity\_data",

"numberOfMachines":2,

  "nozzle\_diameter":"nozzle\_diameter\_24\_throughput"

}

speed,desired Time and rpm can be omitted by providing 0 values in each parms.

Response will be the following object:

{

    "cleaningTimeInMinutes": 180,

    "cycles": 2,

    "nozzle\_diameter\_24\_throughput Capacity": 55.55,

    "washing\_Media\_Amount": {

        "nozzle\_diameter\_24\_throughput for 3.00 hours": 166.65

    }

}