

DOSING PUMPS
USER REQUIREMENT SPECIFICATIONS

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2 SCOPE

The project will include several new dosing pumps. This document defines the requirements and deliverables for these pumps. It describes overall requirements that must be met to produce the specific equipment requested. This document covers the procurement and delivery of the systems, with no required installation.

This URS is the input document for the:

- Equipment procurement purposes.
- Equipment sizing
- Functional and technical specifications.

3 BACKGROUND

The Dakota Bioproducts Innovation Institute is a research facility for the development of high quality bioproducts. Dosing pumps have been identified as one of the pumping methods that will be available for customer use. The quantity of dosing pumps to be purchased remains to be determined.

4 PROCESS DESCRIPTION

The Dosing Pumps will be used to transfer many types of liquids. Wetted materials shall be selected with the understanding that the pumps will be used for general purpose and could be subjected to harsh chemicals. Typical pump uses will include pH adjustment, chemical dosing, and precise metering of process liquids.

5 BASIS OF DESIGN

5.1 Capacities

Two different capacities have been specified. One pump shall be designed for approximately 4.5 GPH at 100 psig. The other shall be designed for approximately 55 GPH at 58 psig.

5.2 Operation, personnel and automation

These pumps will be moved around and used in different locations. Exactly how they will be moved and mounted for use remains to be determined. An operator will be expected to move a pump into position, manually make the electrical and process connections, start the pump, and set the flow rate. Starting and stopping the pump, as well as adjusting flow rate, shall be done using controls on the pump.

5.3 Materials of Construction

All materials of construction must be compatible with ambient and hot water for injection (WFI), and typical chemical cleanings agents such as phosphoric acid, potassium hydroxide, and sodium hydroxide up to 3%.

5.4 Reliability & maintenance

The pumps will be designed to operate routinely during 24 / 7 / 365 operations. All wear parts shall be easily accessible and replaced on a regular maintenance schedule. Wear parts like gaskets shall be stock items that can be ordered and delivered in a timely manner.

6 ABBREVIATIONS, ACRONYMS & DEFINITIONS

Acronyms	Description
CIP	Clean In Place
GPH	Gallons Per Hour
OPT	Optional Attribute
PMS	Permanent Magnet Synchronous
PVDF	Polyvinylidene Flouride
PSIG	Pounds per Square Inch Guage
PTFE	Polytetrafluoroethylene
REQ	Required Attribute
SCADA	Supervisory Control and Data Acquisition
URS	User Requirements Specification
VFD	Variable Frequency Drive
WFI	Water For Injection

7 USER REQUIREMENT SPECIFICATIONS

URS TABLE – Dosing Pumps		
Designation	Description	Type
URS-F1	The pumps shall be compact positive displacement diaphragm pumps.	REQ
URS-F2	The smaller pump capacity shall be approximately 4.5 GPH at 100 psig.	REQ
URS-F3	The larger pump capacity shall be approximately 55 GPH at 58 psig.	REQ
URS-F4	The pumps shall be capable of at least 800:1 turndown.	REQ
URS-F5	The pumps shall be able to pump process liquid with maximum viscosity of 500 cP.	REQ
URS-F6	The pumps shall be able to pump process liquid with maximum viscosity of 2000-3000 cP at reduced flow rates.	REQ
URS-F7	The dosing head shall be constructed of PVDF.	REQ
URS-F8	The dosing head shall utilize ball valves, which shall be constructed of ceramic.	REQ
URS-F9	Gaskets/elastomers shall be PTFE.	REQ
URS-F10	PMS motors shall be used and provide the pumps' variable speed capability, such that the pump always operates using a full stroke length and the variable flow is caused by stroke speed.	REQ
URS-F11	The pumps shall include the ability to set the flow rate with controls integral to the pump.	REQ
URS-F12	The dosing heads shall include a deaeration valve for easy startup.	REQ
URS-F13	The pumps shall include the following operating modes: manual dosing in ml/h, l/h, or gph; pulse control in ml/pulse; analog control 0/4-20 mA, pulse-based batch function in ml, l, or gal; timer-based batch function; and Fieldbus control.	REQ
URS-F14	The pumps shall include a feature for auto deaeration during pump standby to avoid air-locking and breakdowns.	REQ
URS-F15	The pumps shall include some means of security to protect against unauthorized access.	REQ
URS-F16	The pump shall include a resettable counter or totalizer for total dosed volume, operating hours, etc.	REQ
URS-F17	The pumps shall include two outputs for sending signals, i.e. alarm, pump dosing, stroke signal, etc, to a SCADA system.	REQ
URS-F18	The pumps shall have integrated pressure and flow measurement.	OPT
URS-F19	A click-stop mounting plate shall be provided for quick and variable installations.	OPT
URS-F20	If necessary, a pressure regulator or relief valve shall be supplied to keep the discharge pressure below 150 psig.	OPT

END OF SPECIFICATION

8 SELECTION CRITERIA

Vendors will be evaluated based on the following criteria:

Evaluation Criteria		
Description	Ranking	Weight
Mandatory Technical Requirements A review of your proposal to determine adherence with the REQ specifications and technical requirements.	1-10	30%
Proposal Pricing Review of your proposal in relation to the services offered in the proposal. Proposals will be evaluated against competing proposals for cost effectiveness. Proposals will be evaluated to be reasonable and appropriate.	1-10	20%
Technical Response The technical response in your proposal portrays knowledge, experience, and professionalism. Relevant product features and/or specifications are available with your equipment other than those mandatory specifications allotted above.	1-10	10%
Lead Time A review of your product's lead time to meet business objectives.	1-10	15%
Product Warranty The available warranty, in scope, duration, and value, proposed with your product.	1-10	5%
Experience and Demonstrated Results Our evaluation will include a review of your history, your experience as it relates to the requirements within this RFP, evidence of past performance, quality and relevance of past work, references, and related items.	1-10	20%

9 RETURN BIDS TO

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10 OTHER PROVISIONS

Must meet 200 CFR buy America Provision • Title 49 Subtitle B Chapter VI [Part 661](#)

Federal Participation Disclosure – “This project will be partially funded with Federal funds from the United States Department of Commerce, Economic Development Administration and therefore is subject to the Federal laws and regulations associated with that program.”

Must meet Federal Contract provision 200 CFR Title 2 subtitle A Chapter II [Part 200](#)

Certification Relating to Prohibited Entity

For contractors, vendors, suppliers, or subcontractors who enter into a contract with the State of South Dakota by submitting a response to this solicitation or agreeing to contract with the State, the bidder or offeror certifies and agrees that the following information is correct:

The bidder or offeror, in preparing its response or offer or in considering proposals submitted from qualified, potential vendors, suppliers, and subcontractors, or in the solicitation, selection, or commercial treatment of any vendor, supplier, or subcontractor, is not an entity, regardless of its principal place of business, that is ultimately owned or controlled, directly or indirectly, by a foreign national, a foreign parent entity, or foreign government from China, Iran, North Korea, Russia, Cuba, or Venezuela, as defined by South Dakota Executive Order 2023-02. It is understood and agreed that, if this certification is false, such false certification will constitute grounds for the State to reject the bid or response submitted by the bidder or offeror on this project and terminate any contract awarded based on the bid or response. The successful bidder or offeror further agrees to provide immediate written notice to the contracting executive branch agency if during the term of the contract it no longer complies with this certification and agrees such noncompliance may be grounds for contract termination.

RESTRICTION OF BOYCOTT OF ISRAEL

For contractors, vendors, suppliers, or subcontractors with five (5) or more employees who enter into a contract with the State of South Dakota that involves the expenditure of one hundred thousand dollars (\$100,000) or more, by submitting a response to this solicitation or agreeing to contract with the State, the bidder or offeror certifies and agrees that the following information is correct:

The bidder or offeror, in preparing its response or offer or in considering proposals submitted from qualified, potential vendors, suppliers, and subcontractors, or in the solicitation, selection, or commercial treatment of any vendor, supplier, or subcontractor, has not refused to transact business activities, has not terminated business activities, and has not taken other similar actions intended to limit its commercial relations, related to the subject matter of the bid or offer, with a person or entity on the basis of Israeli national

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origin, or residence or incorporation in Israel or its territories, with the specific intent to accomplish a boycott or divestment of Israel in a discriminatory manner. It is understood and agreed that, if this certification is false, such false certification will constitute grounds for the State to reject the bid or response submitted by the bidder or offeror on this project and terminate any contract awarded based on the bid or response. The successful bidder or offeror further agrees to provide immediate written notice to the contracting executive branch agency if during the term of the contract it no longer complies with this certification and agrees such noncompliance may be grounds for contract termination.