IWAKI AIR

FLAP VALVE PUMPS

APRIL 2019 LAUNCH
PRODUCT PRESENTATION

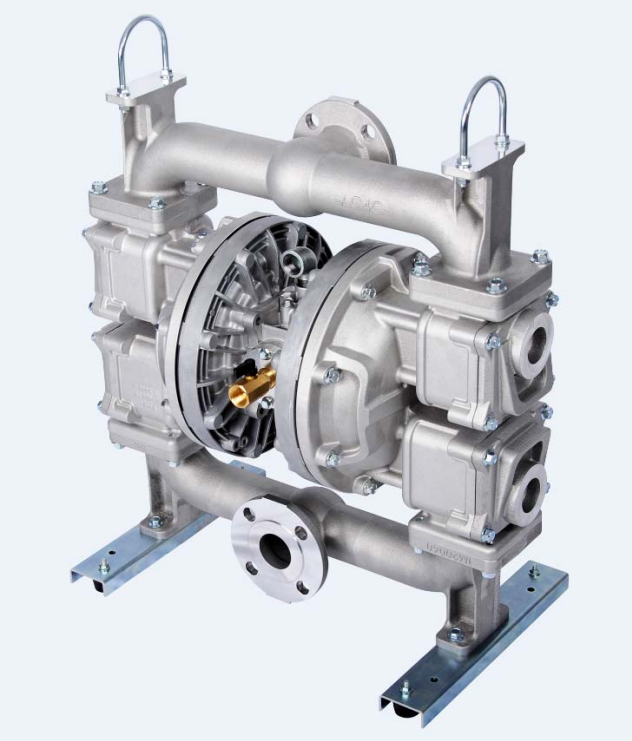
ABOUT IWAKI AMERICA

CONSISTS OF FOUR DIVISIONS

- IWAKI PUMPS
  - Non-Metallic Mag-Drive Chemical Transfer Pumps
  - SANWA Stainless Steel Chemical Transfer Pumps
- WALCHEM
  - Water Treatment Controllers
  - Metering Pumps
- IWAKI AQUATIC
  - Engineered Aquatic Research Systems
- **IWAKI AIR AODD**
  - **Industrial and Pure PTFE Air-Operated Double Diaphragm Pumps**

NEW PRODUCT INTRODUCTION

2” HEAVY DUTY METALLIC FLAP VALVE PUMPS



TWO MODELS AVAILABLE

TC-X500AN-HV-FLA

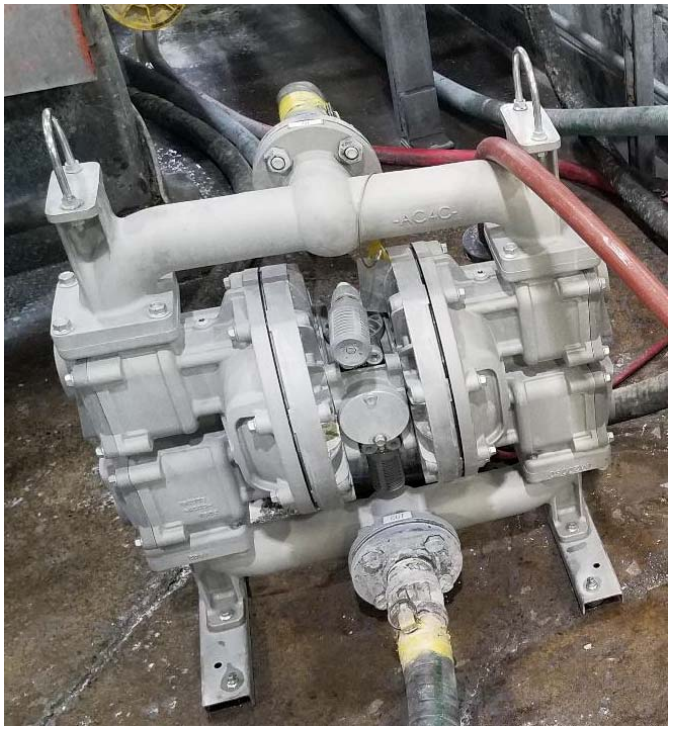
2” Aluminum with HNBR-Encapsulated Flap Valves and BUNA-N Diaphragms

TC-X500AS-HV-FLA

2” Aluminum with HNBR-Encapsulated Flap Valves and Santoprene Diaphragms

FLAP VALVE PUMP CHARACTERISTICS OVERVIEW

- **Incorporates four flap/hinge style check valves**
- **Top Inlet/Bottom Discharge for heavy solids and settling fluids**
- **Designed and Engineered to transfer large-sized solids**
- **Can also Transfer Sludges and Slurries**
- **Very Good for Heavy and Dense Slurries**
- **Very Good handling of Heavy, Solids-laden Slurries**
- **Very Good For Slurries with Fibrous or Stringy Materials**
- **Sometimes Referred to as Slurry Pumps or Hinge-Valve Pumps**



ABOUT THE MARKET FOR FLAP VALVE PUMPS

- **Industrial/Municipal Waste Water applications – 40% to 50%**
  - **Including small industrial and municipal waste water treatment, DAF systems, etc…**
- **General Industry – 20% to 30%**
  - **Utility or Production transfer of liquids containing large solids, fibers, sedimentary particles, etc…**
- **Mining, Oil & Gas – 20% to 30%**
  - **Can be used in place of Ball Check AODD pumps where large solids are present**
- **Food processing – 20% to 30%**
  - **For Batching applications and ingredient transfer as well as food waste disposal**

Estimated market potential in the USA, Canada, Central & South America

Approximately 2000 units per year

TYPICAL FLAP VALVE PUMP APPLICATIONS

- Small Municipal WWTP
  - Deactivated Sludge
- DAF Systems
  - Sludge from Dissolved Air Flotation Treatment
- Food & Beverage
  - Ingredient Transfer and Process Waste
- Mining
  - Solids Dewatering, Drilling Mud
- Tunneling/Boring
  - Solids Dewatering
- Construction
  - Solids Dewatering
- Spill Remediation
  - Solids-Laden Liquids
- Pet Food Manufacturing
  - Process applications & Process Waste
- Meat Processing
  - Rendering Waste
- Fiber Board & Insulation
  - Transfer Fiber-laden Slurries
- Wine / Juice
  - Fruit skins and seeds
- Industrial Waste Water Treatment
  - Solids / Sludge Handling
- Fishing Industry
  - Process Applications & Waste Transfer)
- Chemical
  - Solvents solids, Waste solids/sludge transfer
- Ceramics/Tile Manufacturing
  - Ceramic slip and Waste transfer
- Tank Recirculation / Transfer
  - Solid laden sludge and slurry
- Sump & Drainage Discharge
  - Solid laden sludge and slurry
- Magnet Manufacturing
  - Transfer raw powder laden Slurry

TYPICAL FLAP VALVE PUMP APPLICATIONS

Pumping Chicken Bones & Skin

Pumping Citrus Skins and Seeds

Underground Mine Dewatering Pump

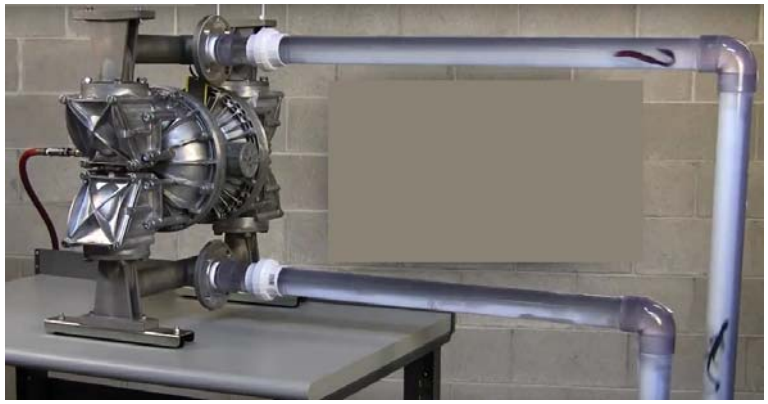
Pumping blood with solids

Rental Pump for Dewatering applications

DAF System Pumps

TYPICAL FLAP VALVE PUMP APPLICATIONS

Fish Transfer / Processing



Wine Waste Transfer Pump

Wine / Grape Skins Transfer Pump

Mine Dewatering Pump

Construction Dewatering Pump

Mine and construction Pumps

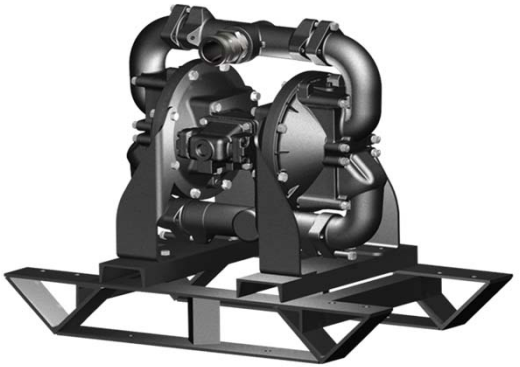
TYPICAL FLAP VALVE PUMP APPLICATIONS

Tank recirculation/Transfer Pump

Portable pump to Empty Sump or Pits

Tunnelling Dewatering Pumps

Spill Remediation Pump



Iwaki AIR FLAP VALVE PUMP DESIGN ADVANTAGES

Flap Valve Pumps Utilize Top-Inlet/Bottom Discharge to ensure passage of materials through the Pump

- Allows for passage of larger solids than traditional ball check AODD pumps
- Gravity assist is ideal for pumping liquids with settling solids and slurry
- Able to Transfer Sludge & Slurry with large sized hard or soft solids up to 2”
- Able to Transfer Slurries with very high percentage Solid-Laden materials
- Able to transfer Sludge & Slurry containing stringy & fibrous materials
- Able to handle Slurry with heavy or dense Sedimentary particles
- Eliminates typical damage caused by settling solids in the pump
- Flap valve pumps generate Very High Vacuum & Suction pressure
- Flap Valve Pumps have relatively High flow rates.

COMPETITOR FLAP VALVE PUMP DISADVANTAGES

- Short Flap Valve life expectancy can be from
  - Inferior Flap valve materials of construction
  - Damage to flap from abrasive passage of solids
  - Failure of the flap because of cheap and/or poorly designed flap valves
- Requires a lot of maintenance to the pump with more frequent service intervals
- Must pull the pump out of service to perform even the most basic maintenance needs
- Requires maintenance personnel to fully dismantle pump just to inspect, clean or change the flap valves
- Tend to get clogged with debris which requires more regular cleaning or inspection so have to pull the pump
- Don’t handle abrasives well with aluminium construction & typically low-quality flap components
- Run with high back pressure or dead head which can lead to stalling issues
- Some pumps operate 24/7 which lead to high air consumption costs

TC-X500 SERIES FLAP VALVE PUMP OVERVIEW

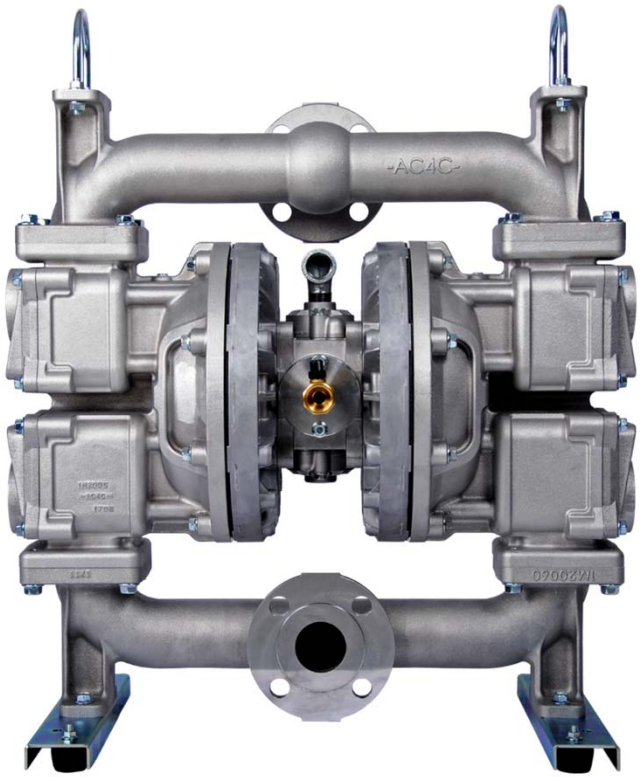
Model Descriptions

TC-X500AN-HV-FLA Nomenclature

500A:	*2" Aluminum Pump Heavy Duty Mechanical Air Spool Model*
N:	*Buna-N Diaphragms and Seals*
HV:	*Hinged Flap Valves (HNBR* Encapsulated Steel Flap Valves)*
FLA:	*Flanged Liquid Connections (Center Ported)*

TC-X500AS-HV-FLA Nomenclature

500A:	*2" Aluminum Pump Heavy Duty Mechanical Air Spool Model*
S:	*Santoprene Diaphragms and Seals*
HV:	*Hinged Flap Valves (HNBR* Encapsulated Steel Flap Valves)*
FLA:	*Flanged Liquid Connections (Center Ported)*

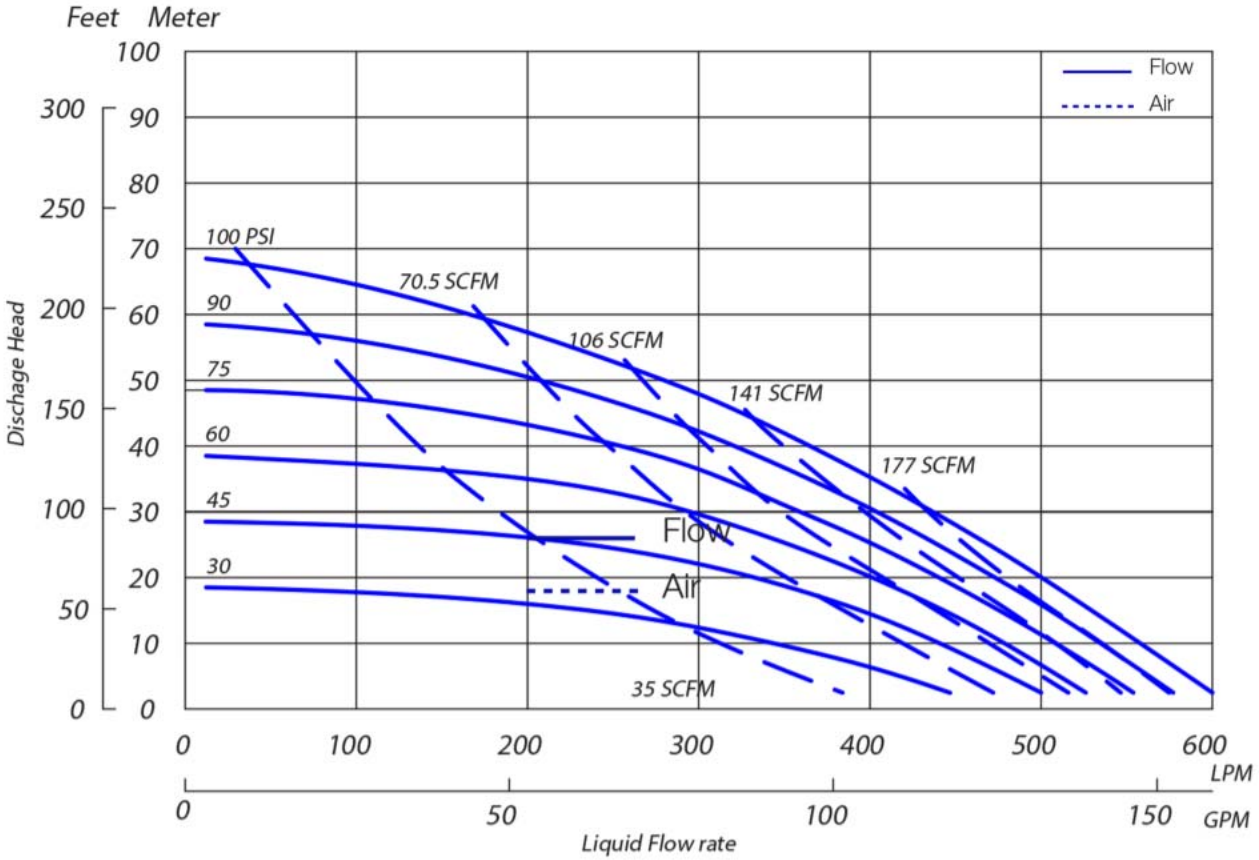


Pump Performance Data

Max Flow Rate:	158.5 GPM (600 LPM) (Buna-N Diaphragms)
Max Discharge Pressure:	100 PSI (0.7 MPa)
Max Air Inlet Pressure:	100 PSI (0.7 MPa)
Max Solids Size:	1.2" (30mm) Spherical or 0.60" (15mm) × 1.77" (45mm) Oblong
Pump Weight:	160 Lbs. (73kg)

(*) HNBR (Highly Saturated Nitrile) has better wear and abrasion resistance than standard NBR (BUNA-N) and improve upper temperature range

TC-X500 SERIES FLAP VALVE PUMP PERFORMANCE CURVE



OPERATING POINTS OF THIS CURVE

- MAXIMUM FLOW RATE
  - UP TO 158.5 GPM (600 LPM)
- MAXIMUM DISCHARGE HEAD PRESSURE
  - UP TO 225’ (68.6 M)
- MAXIMUM REQUIRED SCFM
  - UP TO 211.9 SCFM (6000 L/M)
- MAXIMUM INLET PRESSURE
  - UP TO 100 PSI (0.7 MPa)

TC-X500 SERIES PRODUCT FEATURES

Heavy Duty Construction

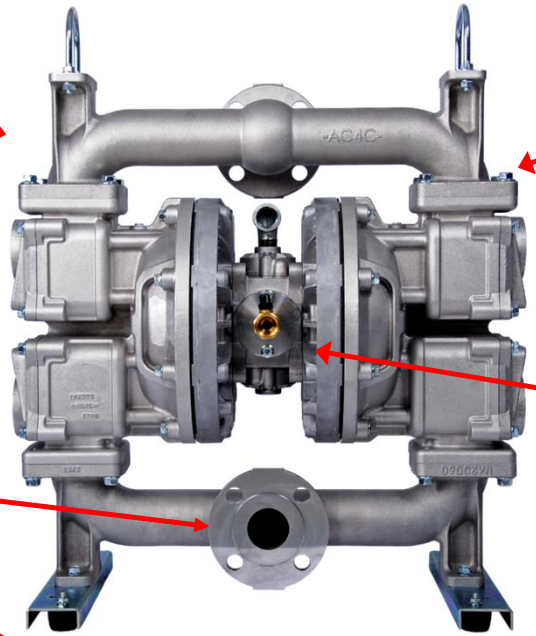
- 160 Lbs. (73 Kg) Total Net Weight
- Thick Walled Construction
- Reinforced Flanges, Legs & Manifolds
- Manifolds Require Only Four Bolts
- Heavy Duty Designed Flap Valves
- Designed to handle highly abrasive slurry
- Designed to handle 2:1 high pressure discharge

Flanged liquid Connections

- Fully Bolted Construction
- Thick & Reinforced Design

Wide, Sturdy & Stable Base

- Modular and replaceable
- Stainless Steel construction
- Drop in dimensions
- Rubber feet



All Bolted Construction.

- Fully Bolted manifolds
- Mating Surfaces are Machined

Heavy Duty Mechanical Air Motor.

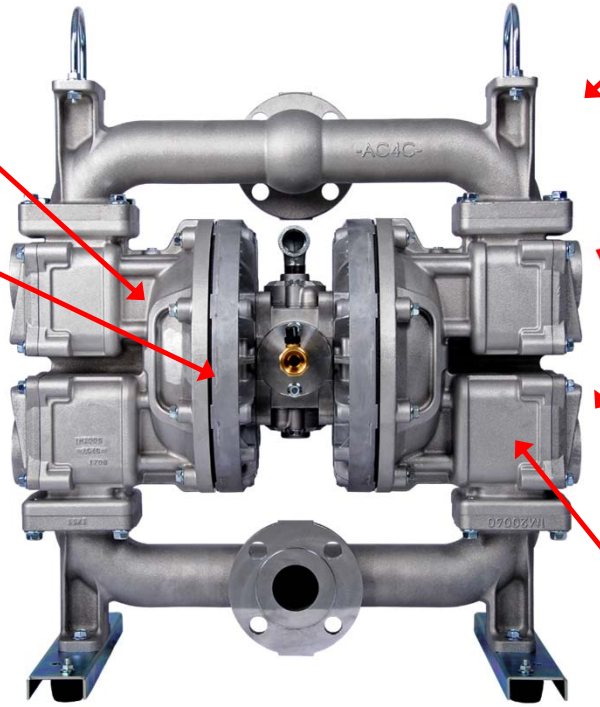
- Fitted with Heavy Duty Mechanical Coil Spring-assisted, non-centering Air Spool
- Designed for very difficult & demanding liquid transfer applications
- Resists stalling and freezing in nearly all operating conditions
- Can reliability and efficiently achieve very high flow rates & high discharge heads

TC-X SERIES PRODUCT FEATURES

Vented Diaphragm Chambers
- Alleviates trapped air/gas issues

Air Motor
- Heavy Duty Mechanical Air Motor
- No Oil or Grease lubrication Required
- Emissions Free Exhaust Air
- Outside Accessible Air Spools
- Unified Air Motor with Common Parts
- Efficient Air Consumption
- No Air Blow through

Additional Pump Features
- Drop-in Dimensions
- Fully Bolted Construction
- Designed for Ease of Service
- All Modular Wear Components
- High Flow Rates
- High discharge Pressures
- High Vacuum Pressures



Pump Design
- 2” Aluminium Pump
- HNBR Rubber Encapsulated Steel Flap Valves
- Top-suction / Bottom-Discharge keeps solids from settling in pump
- Integrated Flap Valve Access ports
- Permits passage of soft solids up to 2 inches

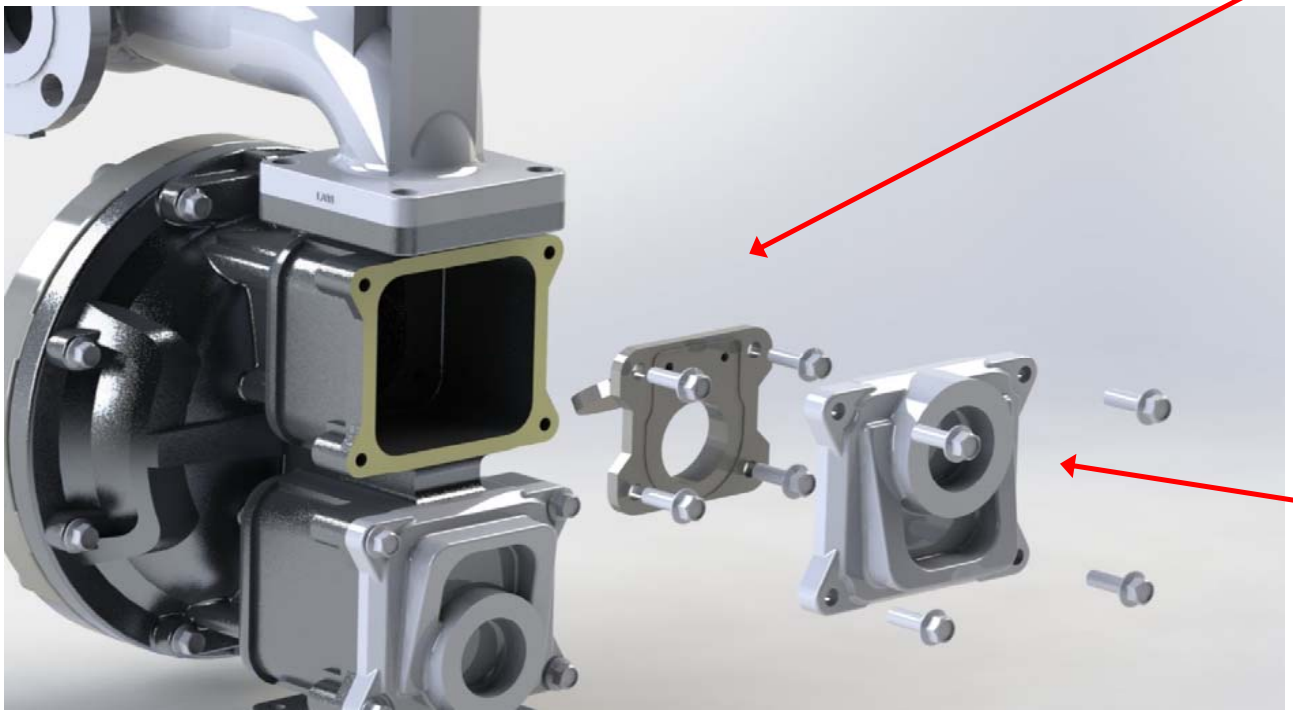
Flap Valve Access Ports (X4)
- Ease of Access for Service
- Ease of Access for Inspection
- Ease of Access for Cleaning
- No need to remove the pump from service

In-line maintenance facilitates servicing pump without removal from installation

HNBR Heavy-Duty Flap Valves
- Modular unit with Extended life expectancy
- Extended flex life
- Abrasion resistant
- Impact resistant
- Cut Resistant

HNBR has higher chemical temperature, abrasion and flex life when compared to standard Buna-N

TC-X SERIES PRODUCT FEATURES – FLAP VALVE BOX (EXPLODED VIEW)



Flap Valve Pump Design Features

- Fully Modular Construction
- Very Heavy Duty Design
- HNBR Rubber Encapsulated Steel
  - High mechanical strength
  - Abrasion Resistant
  - Impact Resistant
  - Cut Resistant
  - Temperature resilient
  - Chemical resistant
- Clean, Remove or Replace Directly
- Remove with Only Four Bolts
- 3rd Generation Design – Latest & Greatest

Flap Valve Access Panels

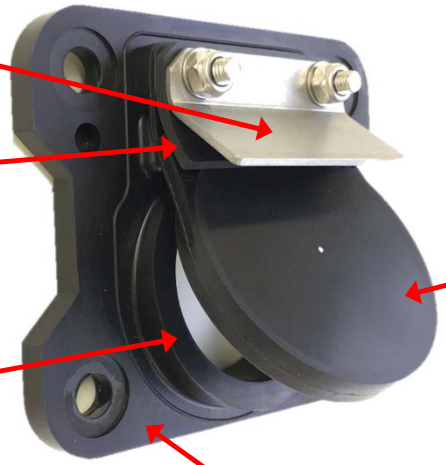
- Easy External Access
- Four Bolt Access Design
- Easy Inline Maintenance
  - Easy access for service
  - Easy access for inspection
  - Easy access for cleaning

TC-X500 SERIES PRODUCT FEATURES (FLAP CHECK VALVE DESIGN)

Stroke Control Bar
- Reduces over stroke (Over flex)
- Helps to rebound flap
- Helps Improve flex life

NBR Stroke Pad
- Reduces over stroke (Over Flex)
- Reduces impact
- Helps to rebound flap
- Helps improve flex life

HNBR Flap Seat
- Special Raised & Angled Seat Design
- Heavy duty construction
- Compensates for wear & tear over time
- Allows faster seating of flap valve
- Allows for better sealing
- Cut & abrasion resistant
- Chemical & heat resistant
- High Mechanical strength and more flexible



Modular Construction
- 4 bolts for Easy replacement
- Sold as a modular set
  - Parts can also be sold individually
- Heavy duty construction
- Rubber on rubber sealing
- Integrated gasket > No O-rings

HNBR Flap Valve
- HNBR Rubber Encapsulated steel plate
- Heavy duty construction
- Cut & abrasion resistant
- Chemical & heat resistant
- High Mechanical strength and more flexible
- Raised from Base plate to reduce chance of solids jamming / abrasion damage

- **HNBR Base Plate**
- HNBR Rubber Encapsulated steel plate
- Heavy duty construction
- Cut & abrasion resistant
- Chemical & heat resistant
- High Mechanical strength and more flexible
- 4 bolt removal
- No gaskets or O-rings

TC-X500 SERIES TRIAL PUMP APPLICATION (GYPSUM TRANSFER)

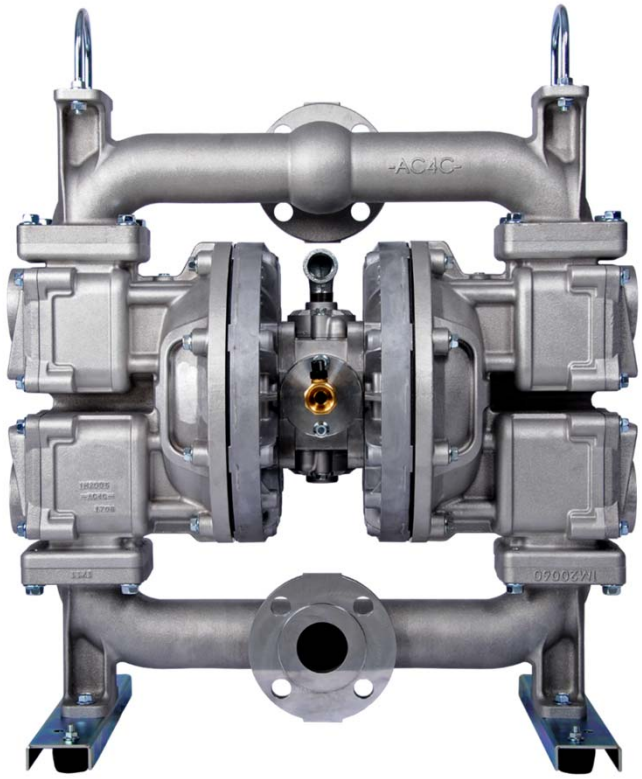
MAJOR FLAP VALVE PUMP COMPETITORS

MOST COMMON FLAP VALVE PUMP MODEL

- 2” Aluminium with NBR diaphragms

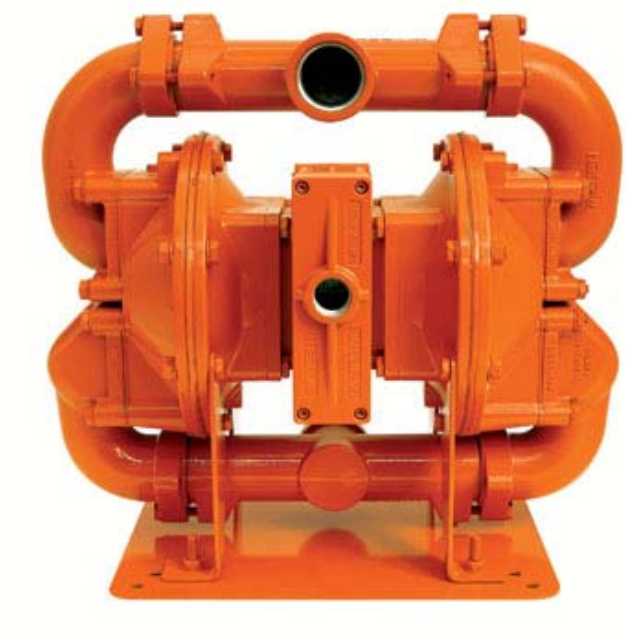
COMPETITIVE BRANDS

- **Warren Rupp (Sandpiper HDF Series)**
  - Market Leader – IDEX Corporation
- **Wilden (Brahma)**
  - Sandpiper Copy – Dover Corporation
- **Warren Rupp (Marathon MSA/MHDF Series)**
  - Sandpiper Private Label – IDEX Corporation
- **Warren Rupp (Blagdon X25/X50/X75 Series)**
  - Sandpiper Based Design – IDEX Corporation
- **Yamada (SolidPRO Series)**
  - Since 2007 – Original design by Shigiru Murata (YTS)
- **ARO (PF20 Series)**
  - ARO Designed – Ingersoll Rand Corporation



MAJOR FLAP VALVE PUMP COMPETITORS

SANDPIPER



WILDEN

YAMADA

MAJOR FLAP VALVE PUMP COMPETITORS

ARO

MARATHON

BLAGDON

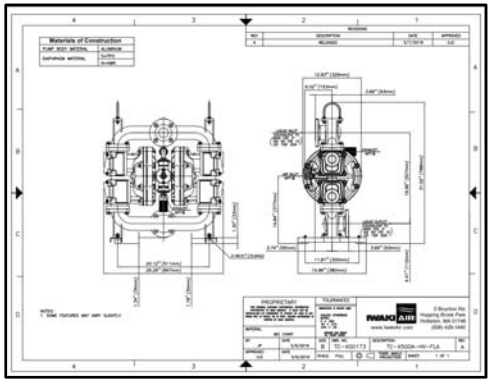
TC-X500 SERIES COMPETITOR ANALYSIS

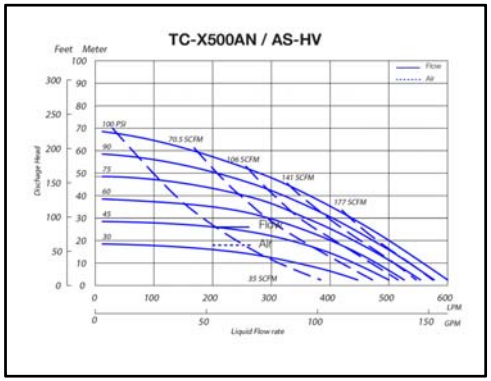
SPECIFICATION	IWAKI AIR FLAP VALVE		Yamada SOLIDSPRO SERIES		SANDPIPER HDF SERIES		Wilden BRAHMA SERIES		ARO PF20R/Y SERIES	
	ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
MAX FLOW RATE	158.5 GPM	600 LPM	158.5 GPM	600 LPM	208 GPM	787 LPM	169 GPM	640 LPM	172 GPM	651 LPM
MAX INLET AIR PRESSURE	100 PSI	0.7 MPa	100 PSI	0.7 MPa	100 PSI	0.7 MPa	125 PSI	.86 Map	120 PSI	.83 MPa
MAX SLURRY SIZE	1.8"	45 mm	1.18"	30 mm	2'	50 mm	2"	51 mm	2"	50 mm
DRY SUCTION LIFT	16.5'	5.0 m	24'	7.2 m			24.3'	7.4 m	14'	4.2 m
WET SUCTION LIFT	26.3'	8.0 m					29.5'	9.0 m		
CONNECTION SIZE(S)	2" FLANGE		2" FLANGE/NPT		2" NPT		2" FLANGE		2" NPT/FLANGE	
WETTED MATERIALS	ALUMINUM		ALUMINUM		ALUMINUM, CAST IRON, STAINLESS STEEL		ALUMINUM, CAST IRON		ALUMINUM, CAST IRON, STAINLESS STEEL	
DIAPHRAGM MATERIALS	BUNA, Santoprene		BUNA		BUNA, NEOPRENE, HYTREL, Santoprene, EPDM		BUNA, NEOPRENE		Santoprene, BUNA, PTFE/Santoprene, Viton	
FLAP VALVE MATERIAL	HNBR		HNBR				BUNA, NEOPRENE		EPDM, BUNA, Viton, POLYURETHANE	
AIR MOTOR TYPE	MECHANICAL		C-SPRING SLEEVE & SPOOL		SPOOL VALVE		PRO-FLO SHIFT		UNBALANCED SPOOL	
MAX DISCHARGE/CYCLE	.925 G	3.5 L	.791 G	3.0 LPM	.47 G	1.8 L	.475 G	1.8 L	1.4 G	5.3 L
PRODUCT WEIGHT	160 LBS.	78 KG	115 LBS.	52 KG	88 LBS.	39.9 KG	81 LBS.	37 KG	166 LBS.	75.4 KG
MAX AIR CONSUMPTION	211.9 SCFM	6000 LPM (ANR)							140 SCFM	

TC-X500 SERIES PRODUCT SUPPORT MATERIALS

Data Sheets

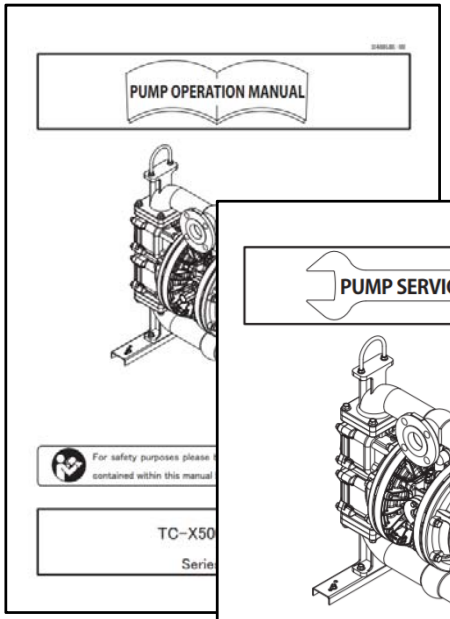
Drawings

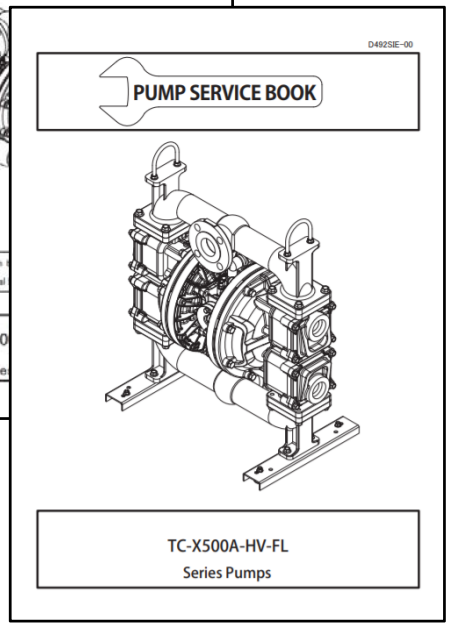




Performance Curves

Operation Manuals





Service Manuals

Available for Download at www.IwakiAIR.com