

## Overview

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Dura Products is a division of DistributionNOW based in Canada, focused on the design and manufacture of high-end rod pumping systems and production accessories.

Dura Products has been in business for almost thirty years and has a loyal customer base in both Canada and Europe. We do not strive to be the lowest cost provider of rod pumps or components, but rather to provide superior quality, fit for purpose equipment that will provide our customers with the most cost effective method of producing hydrocarbons.

We have a highly experienced, stable, and motivated workforce dedicated to the design, development, and manufacture of rod pumping systems and related accessories. We believe that we are uniquely positioned as a focused rod pump provider with extensive technical expertise.

## Products

Dura Products manufactures specialized products in the following categories:

- Pump parts
- Production accessories
- Stuffing boxes

These products are described in detail on the following pages.

## Pump Parts

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### Balls and Seats

A-Plus Balls and Seats	This ball and seat is manufactured from titanium carbide. The ball and seat are homogenous throughout, and the core and skin of these units are of the same strength. The ball is harder than one made of cast carbide and therefore has a higher resistance to galling and spalling.
Endurall Balls and Seats	Made of high quality non-magnetic, non-ferrous alloy, it is composed primarily of Cobalt, Chromium, and Tungsten. The ball composition is the Stoody grade #2 with hardness of 58-63 RC, and the seat is recognized as a Stoody grade #1 with a hardness of 45-51 RC. The Ball and Seat combination have proven an outstanding performer world-wide in extreme abrasive and/or corrosive environments.
Tungsten Carbide Seats	Made of cemented Tungsten Carbide material with a hardness of 73 RC, which has unusually high resistance to fluid cutting, sand abrasion, spalling and corrosion. This product is today's ultimate in valve material and is recommended where all others have failed.
Superloy Balls and Seats	Made of high quality, rigidly controlled corrosion resistant stainless material with a hardness of 57-61 RC and 50-54 RC on the ball and seat respectively. This, our most popular grade, has proven itself in oil fields world-wide to be a consistent-performer under most well conditions. It is recommended for wells where extreme abrasion and corrosion are not the prime factor.

### Barrels

Barrels can be provided with chrome plating or nicarb coating – whichever best suits the well condition. Chrome plated barrels have **.003 I.D.** chrome per side, while nicarb coated barrels have **.0015 O.D. and I.D.** coating per side.

Dura B-CH Brass Chrome	Manufactured of admiralty inhibited brass and internally plated with chromium. The copper and zinc alloy brass tube is more resistant than steel to the corrosive effects of well bore. The combination of brass and chrome results in a barrel that can be run in both abrasive and corrosive wells as classified by API.
Dura G-CH Steel Chrome	Fabricated from carbon steel material and has a uniform thickness of chrome plating on the I.D., offering resistance to abrasive sands and foreign materials.

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- Dura G-NI Steel-Nicarb** Has a composite coating of hard nickel alloy with extremely hard particles of silicon carbide dispersed throughout, in addition, the coating is impregnated with Teflon. The composite coating is very resistant to corrosion, and the carbides in the hard nickel matrix provide an excellent, wear-resistant surface. The barrel is coated internally and externally for corrosion and wear resistance.
- Dura H Carburized Steel** Fabricated from a specially selected carbon steel material suitable for carburized hardening on the I.D. to 52/58 RC. The barrel is precision honed to a mirror like finish; this combination provides the excellent wearing qualities of hardened and honed steel barrel. The barrel is recommended for moderately abrasive conditions.
- Dura Z-CH 501-Chrome** Made from 501-Chrome Alloy which has 4% to 6% chromium in the base material and has been an effective performer in mildly corrosive wells. It is chrome plated on the I.D. giving the barrel excellent wear characteristics for wells producing abrasive type materials.

## **Guide, Valve Rod**

- API** The Valve Rod Guide is used on all stationary barrel insert pumps. This fitting is used as a guide to reduce flexure in the valve rod. A “fishing neck” is provided on the guide for ease in retrieving the bottom hole pump if the valve rod fails. A prong and slot style clutch is provided so that sucker rod style “on and off” tools can be used.
- 8-Port** The 8-Port Valve Rod Guide features a unique discharge design. Whereas the standard valve rod guides discharge the fluid in an outward or horizontal direction, the 8-Port valve rod guide discharges the fluid in an upward or vertical path. This design helps to reduce the potential for localized tubing wear due to turbulent fluid flow.

## **Spiral Guide**

The Spiral Guide is provided with the same size of sucker rod thread terminal on each end and is available in either a box by box coupling, or box by pin bushing configuration. It has a metal sprayed guide section that provides a hard, wear resistant surface for heavy pumping conditions. It is also available in a non-metal sprayed design.

## **Spool Check Valve**

The Spool Check Valve was designed to assist the travelling valve in opening during the down stroke on gaseous wells. The gaseous fluid in the pump chamber tends to delay the opening of the travelling valve because of its compressibility. The pressure above the plunger is greater than the pressure below the plunger. With standard pumps much of the down stroke is used to compress the mixture in the pump chamber. The spool check valve removes the pressure off the plunger valve therefore allowing it to open sooner and increasing the pump efficiency.

The spool check valve is available for stationary barrel bottom hold down pumps in brass or hardened stainless steel. The spool check valve also works as an excellent sand check valve.

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## **Hold-Downs**

Dura Products announces the availability of its Universal Pump Hold Down System (Patented) which allows a conventional reciprocating rod pump or rotational progressive cavity pump (PCP) to be installed interchangeably into the same seating nipple. This feature makes the product particularly well suited for thermal production where operators may have a need to change the pump type as the well's temperature profile changes during steam injection or production. The system can be configured for either top or bottom hold down configuration as required.

For either pump type the installation is very simple – set down to install, and straight pull to retrieve – no additional manipulation of the rod string being required. The axial force can be adjusted to suit the application.

The design can be easily customized for any given tubing diameter, allowing full selective nipple I.D. and is suitable for deviated wellbores and sour environments.

The design features a one piece nipple and inner mandrel with field proven metal-to-metal seals. The hold down mechanism has been carefully designed to provide reliable operation and release in the presence of sand and other solids.

- The 4-1/2" size has been torque tested to 5,000 lb-ft
- The 3-1/2" size has been torque tested to 3,500 lb-ft

## **Insert Cage**

The Insert Cage was developed to provide the maximum service life in the most severe type environment. This premium insert cage was also designed to achieve a maximum flow area and a minimum pressure drop, while offering outstanding wear resistance and reduced service costs. It is available in both an open and closed cage configuration and in sizes ranging from 1-1/4" to 3-3/4".

The cage consists of four parts: a shell, a cobalt alloy insert, a gasket and a connector or bushing. The shell houses the insert and retains the ball and seat. The shell is available in alloy steel, stainless steel or Monel. The insert is manufactured from a wear and corrosion resistant cobalt alloy and functions as the ball guide and stop. The gasket is made from a high temperature, corrosion resistance material, and provides a cushion action when the insert stops the ball. The connector or bushing secures the gasket against the insert and like the shell is available in several materials.

## **On/Off Tool**

The DURA On/Off Tool is efficient and easy to use. They are available in a number of sizes – light, medium, and heavy duty – and as a right- or left-hand release. To latch or lock the tool, the sucker rod string is lowered onto the valve rod or sucker rod already in the well. The tool will engage correctly with the rods since the tool is self-aligning. By setting the weight of the sucker rod string on the tool, it will latch and lock on the rod. By lifting the rod string, the rig crew will be able to tell if the plunger is attached. If it does not latch, set the rod string back down on the tool and slowly rotate the rods to the left. This will help to line up the on-off tool body and tang. Once properly aligned, the tool will latch with the weight of the rod string. This process may have to be repeated several times if the on-off tool will not latch.

To release the tool, lower the pump or plunger to the top or bottom of the stroke and then turn the rods to the RIGHT (left-hand tools are available on special order). To release a left-handed tool, the

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procedure is the opposite of a right-handed tool. New left-handed tools are marked with red tape and have "L.H." stamped on the wrench flat.

## **Pickup Sub**

Designed to connect the pump to the sucker rod string, the Dura Products Pickup Sub is manufactured from cold rolled alloy steel to an exacting straightness. The straightness of the Pickup Sub allows the rod string to drive the valve rod of the pump straight down, decreasing valve rod wear, undue side loading stresses, and reducing rod load ratio. This helps reduce tubing wear and allows the pump to achieve its full bottom hole stroke. These features provide the benefits of reduced pump pulling frequencies, decreased tubing pulls, less rod failures, and overall increased production. Results: reduced lifting costs. The pickup subs are manufactured with standard 3/4", 7/8", or 1" API sucker rod connections.

## **Rod Pump Plungers**

Dura Rod Pump Plungers for metal-to-metal pumps are offered with chrome or metal-sprayed coatings. Manufactured in all API sizes, each plunger must meet our exacting quality standards.

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| Cup-Type Plunger               | Designed to use "Wood Type" valve cups, assembled on a metal plunger mandrel, with a metal spacer between each cup. The cups and spacers are held in place by a locknut. The standard cup offering is a hard plastic.   |
| Dura Monel-Pin Plunger         | Manufactured with a seamless heavy wall tube, sprayed with a fused hard nickel alloy, and assembled with a Monel pin on each end. This corrosion resistant material is also non-magnetic and will increase plunger life where severe corrosion or gyp conditions occur. This plunger is designed to API Assembled Plunger dimensions.   |
| Dura Pressure Actuated Plunger | The logical choice for wells with high sand content, or for use as a clean-up plunger for a newly sand fractured well. All plunger bodies are designed with a -.005" fit. The plunger to barrel seal is activated by the fluid pressure on the cupped plunger ring during the up stroke. However, there is a controlled leakage from the first to second ring and from the second to third ring and so on, which means that each ring carries only a small percentage of the total load. On the down stroke the pressure is removed and the rings collapse. This allows the plunger to fall freely and to allow sand or other foreign material to flow past the plunger and out of the well. Since the plunger rings expand to meet the barrel wall, the pump will continue to perform efficiently as the barrel wears. |
| Dura Ultra Plunger             | Designed for extreme sand conditions. Manufactured from heavy walled seamless tubing the surface is fused with a Carbide metal spray. This unique Dura process gives a surface hardness equivalent to 72 RC. When used in conjunction with a "Sandwiper" this plunger is Dura Products most abrasive resistant design.  |

## Duralloy Plunger

Manufactured from heavy walled seamless tubing and the outer surface is fused with a hard nickel alloy. This provides a 58/60 RC surface that is highly resistant to spalling and flaking and has a very low coefficient of friction. This plunger is ideally suited for the most severe corrosive and abrasive conditions. This is our most common offering.

## Sucker Rod Couplings

Sucker rod couplings are a key component in the successful performance of a sucker rod string. By minimizing the wear and corrosion of couplings, the life of the sucker rod string is increased. This can substantially decrease service and repair costs. Dura Products has set an industry standard with the design of the Premier Performance Sucker Rod couplings including both API Class T (through hard) and API Class SM (spray metal) designs.

### API Class T (through hard)

For excellent service in mild well environments, the API Class T Coupling is the ideal choice. The Class T coupling is manufactured with a through hardness of between 16 and 23 RC. This results in high tensile and fatigue strength for the coupling. The outside diameter is smooth to minimize stress concentrations, and an accurate chamfer allows for controlled contact stress. The threads are rolled full form which results in compressive stresses at the thread root and improved fatigue resistance.

### API Class SM (spray metal)

For harsh well environments, the API Class SM Coupling is the proven leader, especially where severe wear and corrosion is a problem. The Class SM Coupling is also manufactured with a core hardness of between 16 and 23 RC. This results in high tensile and fatigue strength similar to the Class T coupling. A nickel-chrome based coating [0.012”(0.3mm) minimum thickness] is thermally fused to the outside diameter. This results in a surface hardness ranging between 58-62 RC which increases wear and corrosion resistance. The outside diameter is ground to a smooth finish and the coupling is inspected to ensure that there are no pinholes or cracks in the surface coating.

## Production Accessories

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### **Polished Rod Liner**

Polished Rod Liner Assemblies are manufactured from select materials to conform to Dura's rigid specifications. The liner surface is metal sprayed to increase hardness and liner life, and the interior is epoxy coated to protect against corrosion. The OD is ground and polished to a mirror-like finish to assure maximum stuffing box packing life. The Packing Head is welded on to the liner to ensure a leak free connection. The liner head is attached to the Polished Rod with three set screws to ensure alignment. A Packing Ring in the liner head seals against the Polished Rod to reduce the chance of moisture entrapment between the liner and the Polished Rod.

### **Pressure Control Regulator**

The Pressure Control Regulator is designed to simply and effectively control well fluid pressures on pumping or flowing wells. It is spring loaded to maintain a pre-set pressure. This pressure may range from 0 to 1,500 PSIG (0 to 10.3 MPa). The spring adjustment is located outside the valve body for ease in setting and safety, and the adjusting screw is secured from accidental movement by use of a lock nut.

Operating advantages are:

1. Decreased paraffin deposits by holding gas in solution;
2. provides longer life for stuffing box packing by minimizing heading and flowing-off;
3. provides a longer life to all pumping equipment by maintaining a constant operating load;
4. decreases the tendency of wells to bridge or sand heave;
5. Reduces measured GOR which in turn conserves reservoir energy;
6. Extends bottom hole pump life by the equalizing fluid column and the formation pressures on pump valves.

Far superior to bean and adjustable chokes the Pressure Control Regulator can adjust immediately to fluctuations in well pressure. The spring-loaded action also keeps the valve clean and free from abrasive particles that could cut it out. A Chrome-vanadium spring and an API stainless steel ball and seat are standard equipment; however, other grades of balls and seats are available.

A 1/4" (6.3mm) tap is provided upstream of the valve so that pressure across the valve may be checked before the valve is serviced. The ball, seat, and spring can be removed without disturbing the well head connections. The adjusting screw is sealed with an "O" ring and is manufactured with a "bell style" end so that it cannot be unscrewed when the regulator is under pressure. The forged steel body is available in either a tee or cross. Springs are available with the following settings: 0-250#, 0-500#, 0-1,000#, and 0-1,500#. The regulator body pressure is rated at 2,000 lbs.

### **Hydraulic Tubing Drain**

The Hydraulic Tubing Drain provides a positive method of dumping the tubing string fluid, permitting the fluid level to equalize. It is simple in design using hydraulic pressure to shear stainless steel pins that allow the tools' fluid ports to open into the casing annulus. The side ports are very large which allows for quick fluid unloading and do not act as a choke to heavy oil and sand mixtures.

## Stuffing Boxes

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### **Com-Pac**

The Com-Pac Stuffing Box is a self-contained, ultra-low profile, durable unit designed to operate at a pressure of 2,000 PSI (14 MPa). Its trim design is ideally suited for multi-zone completions and low profile well heads. The stuffing box has a threaded bottom connection that allows for easy installation onto a pumping well head completion. It is available with 2-3/8" EUE, 2-7/8" EUE and 3" 8 V API line pipe connections.

### **Dual-Pac**

The Dual-Pac Stuffing Box is a self-contained, low profile, durable unit designed to operate at a pressure of 2,000 PSI (14 MPa). The stuffing box has a threaded bottom connection that allows for easy installation onto a pumping well head completion. It is available with 2-3/8" EUE, 2-7/8" EUE or 3" 8V API Line Pipe connections. The stuffing box is designed to fit in tandem with the Dura Pollution Control Check Valve and Stuffing Box.

### **Pollution Control Check Valve**

The Pollution Control Check Valve and Stuffing Box [PCCV] is a wellhead accessory designed to protect and preserve the environment in the event of a polished rod failure. The PCCV is a solution for potential soil or water contamination problems. The PCCV's method of operation is simple and reliable. When the polished rod breaks and the rod string falls through the PCCV stuffing box and BOP's, the PCCV's check valve closes and blocks the well bore before fluid can escape.

The design features a check valve flapper and a non-metallic wear block that rides against the polished rod. To prolong wear block life it is manufactured from virgin Teflon<sup>®</sup>, which is abrasion resistant, self-lubricating and chemically inert. The wear block is held against the polished rod by an H2S resistant Inconel spring. When the polished rod breaks the complete rod string falls through the PCCV. The spring-loaded valve flapper swings up and seats against a Viton O-ring and closes off the well bore. Well pressure against the backside of the check disk ensures a positive shut off. Once the broken polished rod is replaced the re-installation of the PCCV can protect against future failures.

Two 1/2" (12.7mm) NPT ports are provided which allow for the installation of fluid level or pressure switches. These can be used to sense fluid presence or pressure in the valve body when the PCCV is installed above another stuffing box. It is recommended that the PCCV be installed above another stuffing box to provide a dual pack off. Dura Products manufactures adapters to facilitate the installation of the PCCV with either a Dual-Pac, a Com-Pac, or a Hercules style stuffing box. The PCCV can also function as a lubricator with the addition of light oil and or corrosion inhibitor into the body cavity. Fluid is sealed in at the top of the PCCV by using a standard DURA packing, packing gland and cap.

### **Non-Aligning Union**

The Non-Aligning Union, or Swivel, is a wellhead accessory designed to work with pumping units which are not perfectly aligned with the well head. The Swivel allows for 4 degrees movement off center. This unit can be installed with a 2-3/8" EUE, 2-7/8" EUE, and 3-1/2" EUE thread configuration. All Units are pressure tested to 2,000 psi upon assembly and are field repairable. This union can be used as a Com-Pac stuffing box, or in conjunction with a Pollution Control Check Valve.