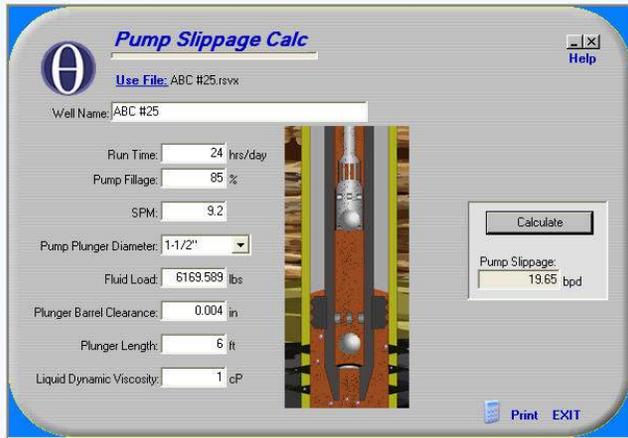


## Pump Slippage Calculator

This module calculates the production loss in barrels per day or cubic meters per day due to fluid slippage based on the clearance between the plunger and pump barrel, fluid viscosity, plunger length, SPM, pressure difference across the plunger, and pump fillage.

The calculation is done using a modified version of the Patterson Equation, which is the most modern and most accurate method available for this purpose.



### System Requirements:

#### Processor:

- 1.6 GHz or higher

#### Operating System:

- Windows XP/Vista/7

#### Memory:

- 1 GB of RAM or higher

#### Hard Disk:

- 125 MB available disk space

#### Display:

- 1024 x 768 or higher

## XTOOLS

Complements RODSTAR, XROD, RODDIAG and XDIAG and allows you to quickly calculate important system parameters for an even better system design. XTOOLS can load data from other THETA file types, minimizing data entry. *It includes six expert calculation modules:*

### 1) SPM-Calc

Calculate the pumping speed for any sheave size you select. Also recommends the V-Belt size and length needed.

### 2) Sheave-Calc

Calculate the motor sheave size you need to get the pumping unit speed you want.

### 3) Gas Anchor Designer

Design a Poor-Boy Gas anchor.

### 4) Tubing Anchor-Calc

Calculate how to properly set a tubing anchor to avoid tubing buckling and excessive rod-tubing wear.

### 5) Polished Rod Picker

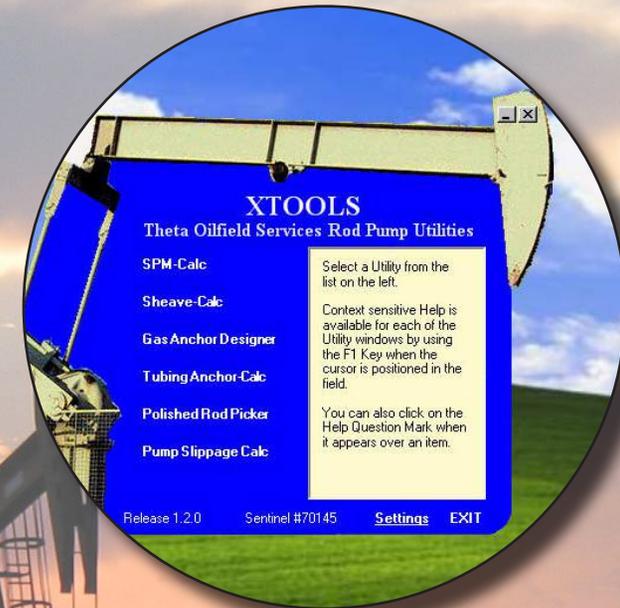
Select or analyze the size or material for your well. This module helps you match the right polished rod for your well conditions.

### 6) Pump Slippage Calculator

Our slippage calculator uses a modified version of the Patterson Equation which gives you the power to calculate slippage for partially filled pumps as well as full pumps.

## XTOOLS

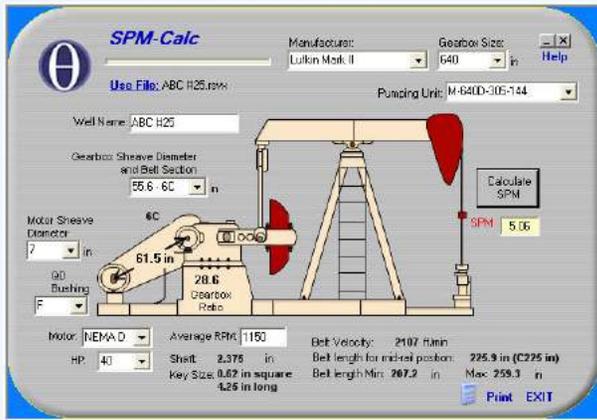
A Six-Module Utility Program for Rod Pumping Systems



www.upcoglobal.com

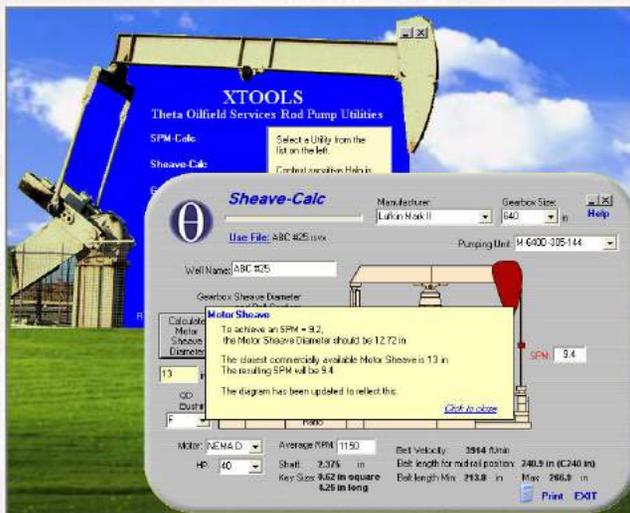
## SPM Calculation

This module calculates the SPM you will get based on the motor sheave and gearbox sheave size selections. Using standard sizes for the available motor and gearbox sheaves will result in an SPM that is slightly larger or smaller than the one in RODSTAR. This allows you to go back to RODSTAR and make another run with the SPM you know you can get, instead of the one calculated by RODSTAR. This module recommends the V-Belt size and length you need, and calculates belt velocity.



## Motor Sheave Sizing

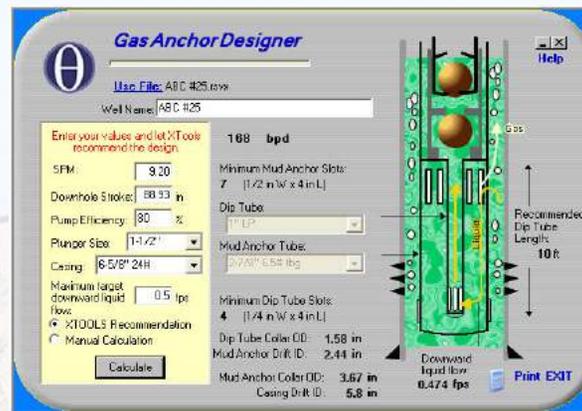
Use this module to calculate the motor sheave size you need to get the target SPM you want. Typically,



after running RODSTAR to design a new system or to make changes to an existing system, you can use this module to determine what standard motor sheave size you need to get as close as possible to the SPM calculated by RODSTAR.

## Gas Anchor Designer

With this module you can have the program calculate everything you need for a successful “Poor-Boy” gas anchor installation. From the SPM, downhole pump stroke (from RODSTAR, XROD, XDIAG or RODDIAG), plunger size, and casing size, the program calculates the pump displacement, minimum number of mud anchor slots, the dip tube size you need, the minimum number of dip tube slots, and the dip tube length you need. It also calculates the downward liquid flow rate to ensure it is equal to or less than the target rate you entered.

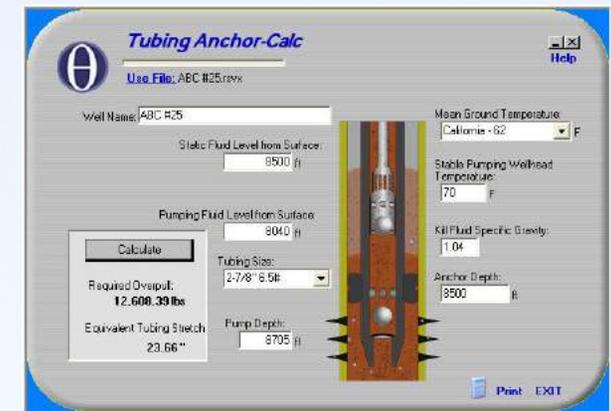


You can either have the program recommend a design for you, or enter your own values for dip tube size and mud anchor size to see what the downward flow velocity will be.

## Tubing Anchor Calculations

This module calculates the tubing anchor overpull and equivalent tubing stretch required to correctly set a tension type tubing anchor. A correctly set tubing anchor helps minimize tubing buckling and rod-tubing wear. This utility uses the calculations recommended by Arthur Lubinski and K.A. Blenkarn

in their famous paper titled “Buckling of Tubing in Pumping Wells, Its Effects and Means for Controlling It.”



## Polished Rod Picker

This module calculates the type, diameter, percent loading, and the minimum length of the polished rod you need based on your well conditions and pumping unit information. Data entry is minimized since most of the data needed can be loaded from a RODSTAR, RODDIAG, or XDIAG file. You can also evaluate an existing polished rod to make sure it is sized correctly for the well.

The program lists most polished rods available in the market. If your polished rod type is not in the



program’s database, you can easily add it yourself.