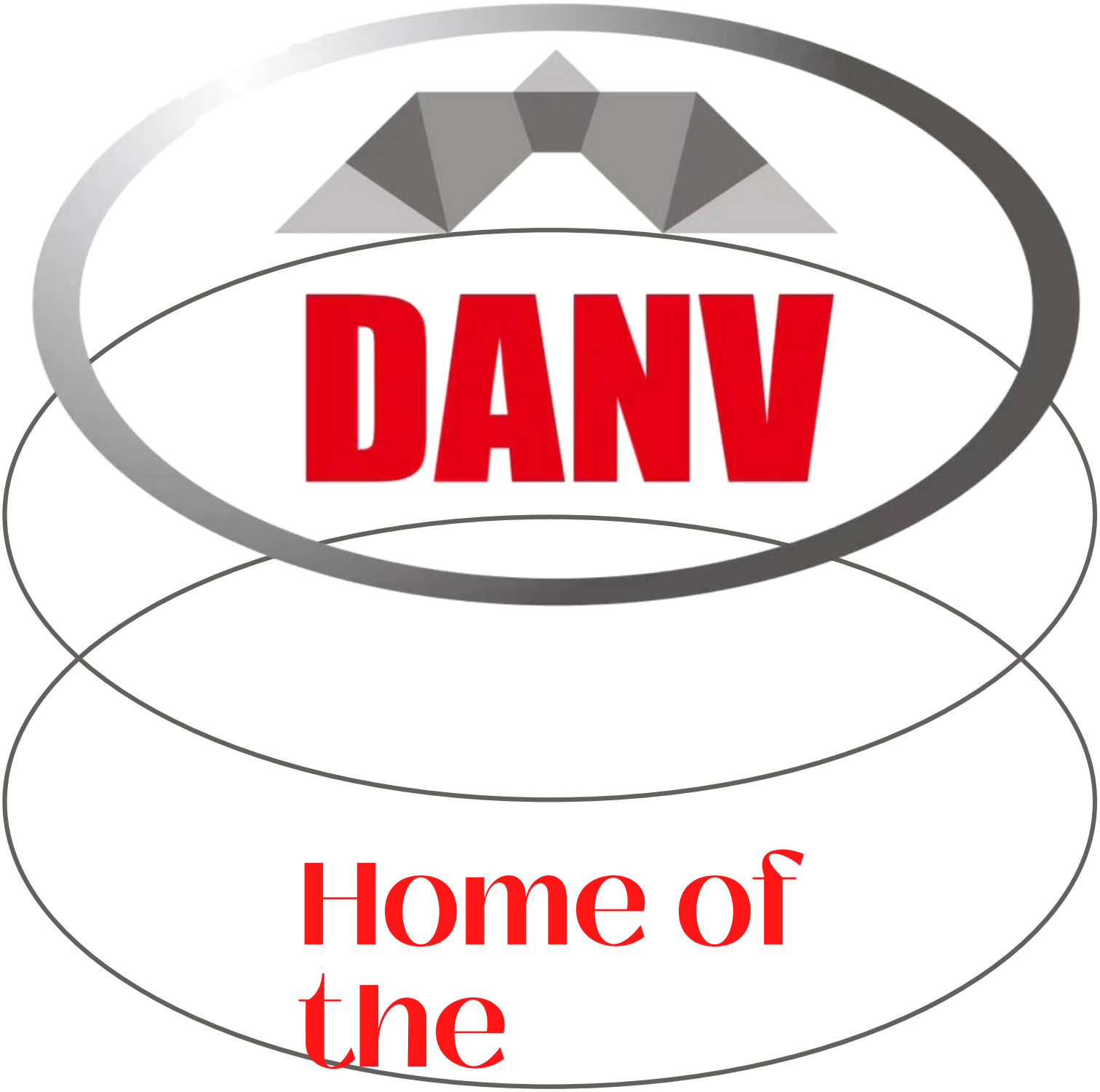



# Home of the Hybrid Bearing

ROTARY DRILLERS
REFERENCE GUIDE

# Table of Contents

# IADC CODES

## IADC CODE REFERENCE

**1** 1 1

First Digit:

1, 2, and 3 designate Steel Tooth Bits with 1 for soft, 2 for medium and 3 for hard formations.

4, 5, 6, 7, and 8 designate Tungsten Carbide Insert Bits for varying formation hardness with 4 being the softest and 8 the hardest.

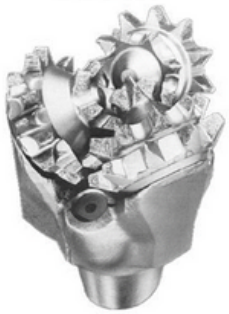
## IADC CODE REFERENCE

1 **1** 1

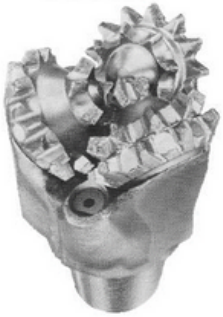
Second Digit:

1, 2, 3, and 4 help further breakdown the formation with 1 being the softest and 4 the hardest.

IADC 116



IADC 126



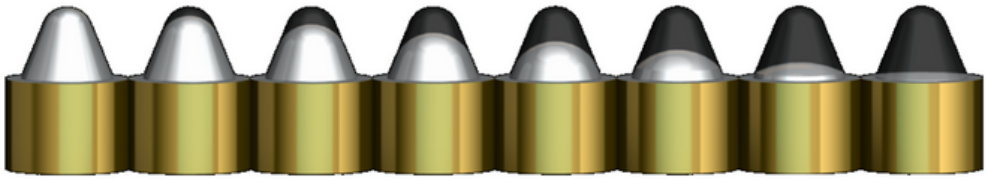
## Tricone Bearing Designs

4 Primary Types of Bearing Designs

- Standard Open Bearing Roller Bit
  3rd digit will end with 1
- Air Bearing Roller Bit
  3rd digit will end with 2 or 3
- Sealed Bearing Roller Bit
  3rd digit will end with 4 or 5
- Journal Bearing Roller Bit
  3rd digit will end with 6 or 7

# Dull Grading

| Cutting Structure | | | | Bearings | | | |
|---|---|---|---|---|---|---|---|
| Inner Rows | Gage Row | Major Dull | Location | Worst Bearing | Worst Location | Other Dull | Shirttail Wear |
| | | | | | | | |



| | | | | | |
|---|---|---|---|---|---|
| BT = | Broken Teeth | HC = | Heat Checking | SD = | Shirttail Damage |
| BU = | Balled Up | JD = | Junk Damage | SS = | Self-sharpening |
| *CC = | Cracked Cone | *LC = | Lost Cone | ST = | Shirttail |
| *CD = | Cone Dragged | LN = | Lost Nozzle | TR = | Tracking |
| CI = | Cone Interference | LT = | Lost Teeth | WO = | Wash Out On Bit |
| CR = | Cored | PB = | Pinched Bit | WT = | Worn Teeth |
| CT = | Chipped Teeth | PL = | Plugged Bearings | NO = | No Other Wear |
| ER = | Erosion | PN = | Plugged Nozzle | | |

| | | | | | |
|---|---|---|---|---|---|
| N = | Nose Rows | H = | Heel Rows | 1 = | Cone # or #'s |
| M = | Middle Rows | A = | All Rows/Cones | 2 = | Cone # or #'s |
| * Show Cone Number (s) under Location, column 4 | | | | 3 = | Cone # or #'s |

Bearings are Graded from 0 – 8

- 0 = New, 8 = Completely used up
- Grade the WORST bearing of the three

Worst (Bearing) Location is Cone 1, 2, 3, or A (all)

- Shirttail Wear is S, M, or H
  - Slight – slight undercutting of inserts. No major damage.
  - Moderate – undercutting of inserts. Some insert loss
  - Heavy – major loss of ST inserts,

# Common Issues & Possible Solutions

## 1. Cored Bit

- Too much weight on bit (WOB)
- Bit is too soft
- Air pressure too low

### Solutions

- Reduce weight on bit
- Select a harder bit
- Increase air pressure

---

## 2. Worn bearing

- Not enough air to bearings
- Too much weight on bit
- Plug air passage

### Solutions

- Check system for leaks (Drill string and hoses)
- Check compressor output (min 60 - 65psi on cab gauge)
- Check bit is not cloged in the air ways
- Reduce nozzle size
- Reduce weight on bit

---

## 3. Worn Carbides (Buttons worn flat)

- Bit is too hard
- Rotation is too high
- Not enough weight on bit (WOB)

### Solutions

- Select a softer bit
- Reduce rotation speed
- Increase weight on bit

---

## 4. Broken Gage Carbides

- Rotation speed too high
- Bit is too soft for ground condition

### Solutions

- Reduce rotation speed
- Select a harder bit

# Continued

## 5. Lost Carbides

- Erosion due to over drilling
- Air blasting body away

### Solutions

- Reduce weight on bit (WOB)
- Increase rotation speed
- Increase nozzle size

## 6. Broken Inner Carbides

- Too much weight on bit (WOB)
- Bit too soft for ground

### Solutions

- Reduce weight on bit (WOB)
- Select a harder bit

## 7. Worn Shirttail

- Failing to cler cuttings
- Bit worn (Undersize)

### Solutions

- Check Compressor output
- Reduce rotation speed
- Reduce water injection rate

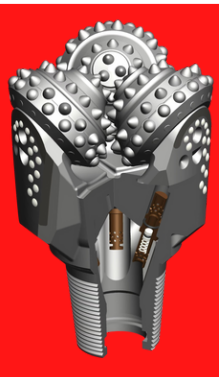
## 8. Single Worn Shirttail

- Bent drill pipe
- Cross threaded bit

### Solutions

- Check drill string
- Inspect bit connection

# Danv Rotary Series



DH Series
Featured - Sealed bearing

This is our patented Hybrid Bearing premium product. This product is a Sealed bearing product that gives higher life due to its ability to revert to air bearing and maintain life longer.

DX Series
Air Bearing

This product is our premium air bearing product used in soft to hard ground settings.

FX Series
Top Seller

The fX Series is our air bearing series used for softer ground types in replacement of the traditional steel tooth bit. Great in coal and other softer formations.

WWW.DANV.COM.AU

# Drill More

19b Beale Way, Rockingham WA 6168
Australia
www.danv.com.au
Director & Operations Manager: Samuel Murphy
sam@danv.com.au
+61 439 303 888
Business Development Manager: Suleiman Al Amoudi
s.alamoudi@danv.com.au
+61 439 089 890