DRILLING & DEMOLITION

Channels Orientation

2022

OBJECTIVES

- Recognize drilling modes and determine base material for each mode
- Know the difference between electro-pneumatic and cam-action hammer drills
- Distinguish between bit connection ends and be able to match up to correct tool
- Be able to pick out the correct drill bit for an application
- Be able to pick out the correct chisel for an application
- Be able to pick out the correct tool for an application
- Understand the features and benefits of all tools

MODES OF OPERATION

Rotation Only

Rotation and Hammer

Hammer Only

HAMMERING MECHANISMS

CAM ACTION (metal to metal contact)

ELECTRO-PNEUMATIC (pockets of air)

COMPONENTS OF A DRILL BIT

Carbide Tip – breaks up material

Connection End – attachment between chuck and drill bit

Fluting – removes debris from hole

Hilti's Connection Ends

1 1/8" HEX connection

Industry standard

FITS TE3000 and many competitors breakers

TE-S connection

Hilti only connection

FITS TE805,905,1000,1500

TE-Y connection

Industry standard, known as SDS-MAX

Fits all Hilti combihammers from TE50 to TE92
and Hilti breakers from TE500 to TE706
Will also fit any competitor tool that uses SDS-MAX

TE-C connection

Industry standard, known as SDS+ or just SDS

Fits all Hilti drills from a TE-1 to TE40c
Will also fit any competitor tool that uses SDS+

Smooth Shank

Industry standard

Fits all drills with a Jacobs chuck (also known as keyless,keyed, or 3 jawed)

Hilti's Connection Ends

TE-H Chisel – 1-1/8" Hex

TE-S Chisel – 6 or Multi Groove – Hilti Exclusive

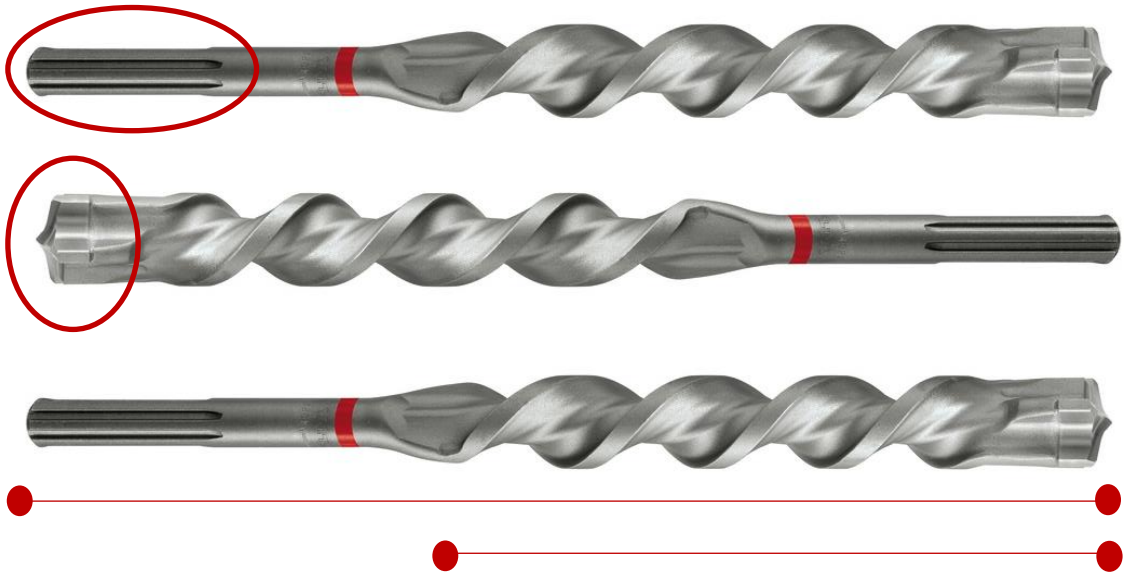
TE-Y Bit – 2 Grooves, 3 Slots – SDS MAX

TE-C+ Bit – 2 Grooves, 2 Slots – SDS +

TM Bit – Smooth Shank

CHOOSING A DRILL BIT

- Determine the connection end
- Select the diameter
- Total length vs Working length
  Example TE-CX ½ x 6”, WL = 4”
- Metric Bits – Why?
- mm Diameter / cm Length
  Example TE-CX 6/17
- Metric Diameter to Fractional Diameter



Drill Bit Video

Determine Drill Bit by Working Length

X BITS AND STANDARD BITS

X - BITS

Ultimate ●●●●●

- FULL carbide tip
- LONGER life
- 4 Cutters
- 4 Flutes
- Rebar resistant or proof
- Wear mark

VS

STANDARD

Premium ●●●●○

- Single carbide brazed tip
- 2 Flutes
- 2 Cutters
- NO steel hits
- NO rebar

CRUCIFORM AND CORE BITS

Starting carbide tip

Multiple cutting edges

Lighter, wider & changeable fluting

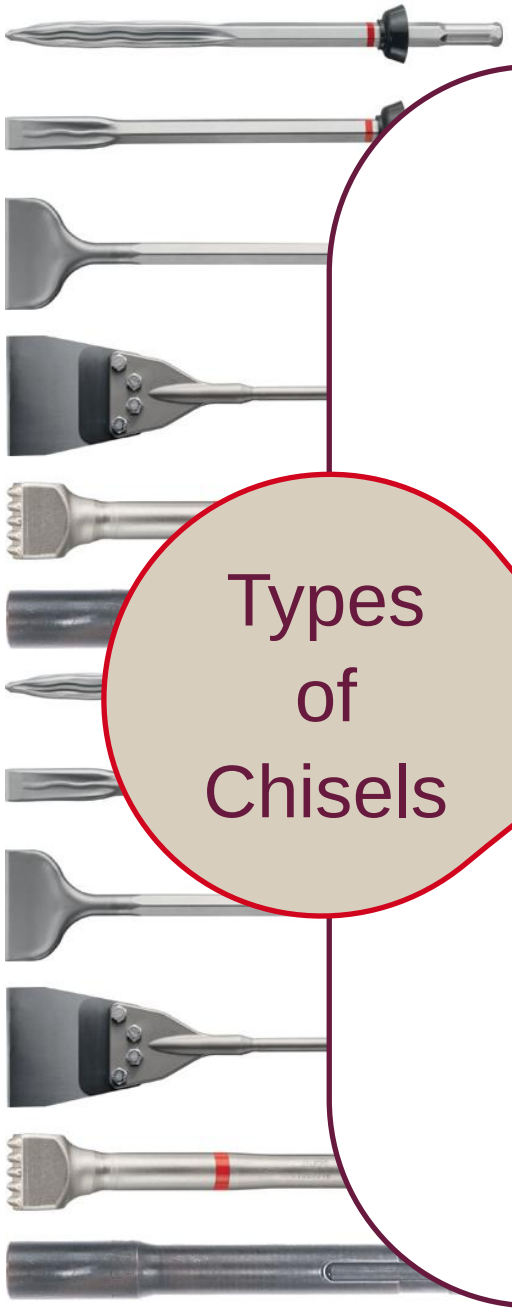
Concrete or masonry

Faster at > 2-5/8” diameter

Chisels

- Chisel descriptions – Hilti nomenclature (TE-YP SM 36)
- Length in CM
- Must determine the application
- Chisel connection end to match tool model

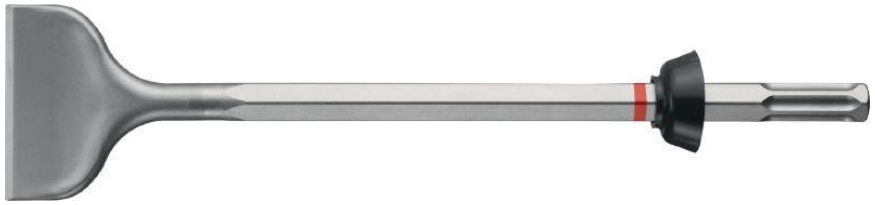
Length and Application Determines Choice of Chisel



Types of Chisels

Pointed Chisel – Uncontrolled Break

Flat Chisel – Controlled Break



Wide Flat Chisel - Scaling

Flexible Chisel – Vinyl Tile Removal

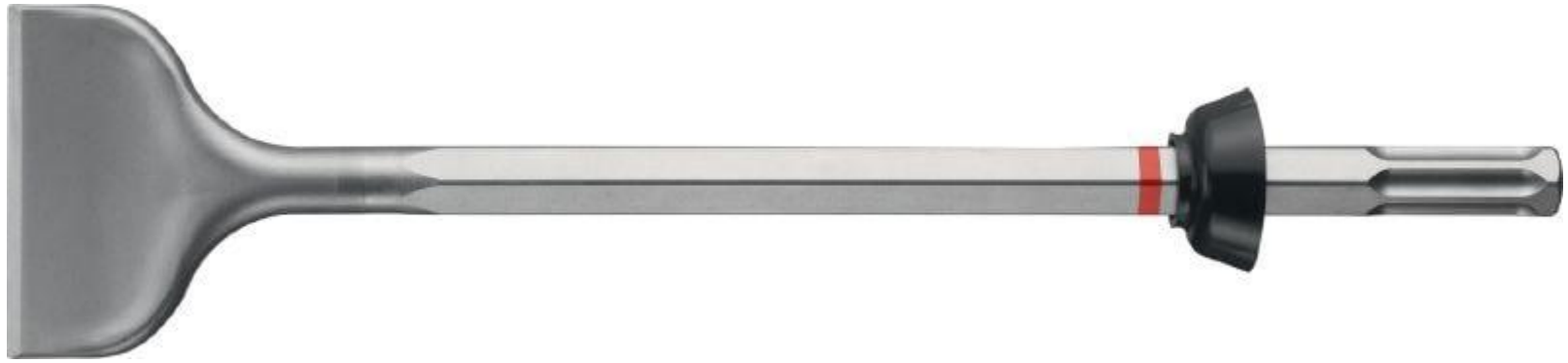
Bushing Tool - Roughening

Ground Rod Adaptor

Pointed Chisel – Uncontrolled Break

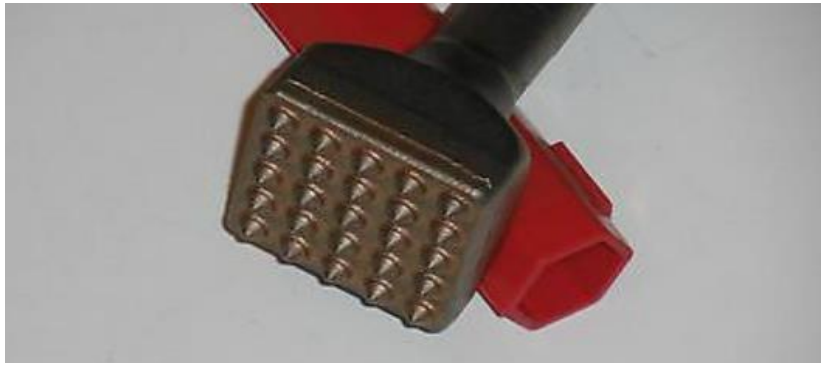
Flat Chisel – Controlled Break

Wide Flat Chisel - Scaling



Flexible Chisel – Vinyl Tile Removal

Bushing Tool - Roughening



Ground Rod Adaptor

WHY ARE HILTI CHISELS DIFFERENT?

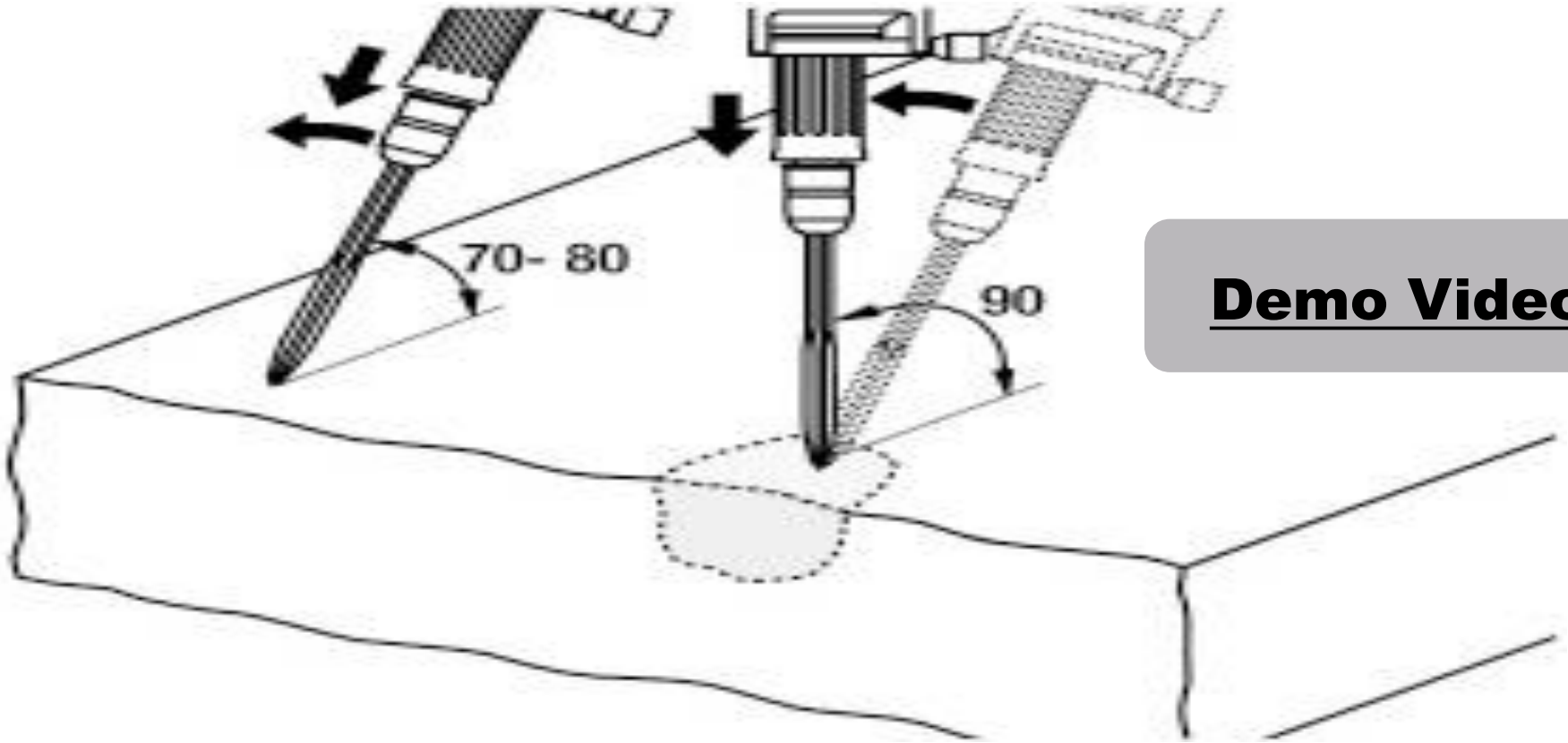
Polygon design for self-sharpening effect

Interior metal is harder than exterior

Polygon shape lessens chance of chisel sticking

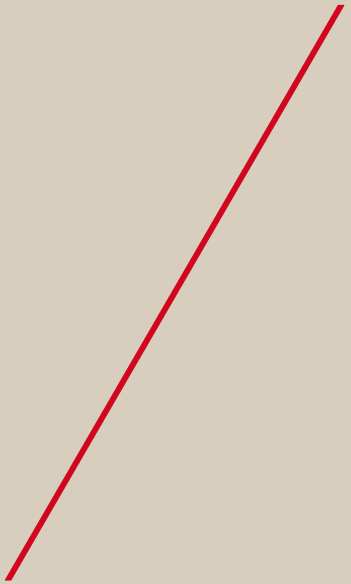
Difficult to sharpen a standard chisel

HOW TO BREAK CONCRETE



Demo Video

KAHOOT?



TOOL SELECTION - DRILL

How do you select the correct drill for a customer?

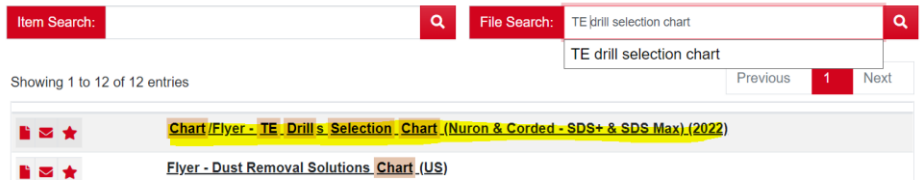
- Start with open probes.
- What are you doing with the tool (drilling into concrete, masonry)?
- What size holes are you drilling (find out about current project)?
- What size holes do you typically drill (determine optimal bit range)?
- What is the largest size hole that you would drill (determine possible bit range)?
- Do you have power at your job (determine if battery tool is needed)?
- Do you need to do any chipping with this tool (determine other features needed)?

You can now select the correct tool – TE Drill Selection chart (myProductSupport or HOL)

Use Funnel Questioning with Open and Closed Probes

TOOL SELECTION - DRILL

Go to myProductSupport > File search side type “TE Drill selection chart” > click to view selection chart



TOOL SELECTOR FOR CORDED ROTARIES

		TE 2	TE 2-S	TE 3-C	TE 7-C	TE 30	TE 30-C-AVR
TOOL							
DRILL BIT DIAMETER	3/16"	✓+	✓+	✓	✓	✓	✓
	1/4"	✓+	✓+	✓+	✓+	✓	✓
	5/16"	✓+	✓+	✓+	✓+	✓	✓
	3/8"	✓+	✓+	✓+	✓+	✓+	✓+
	1/2"	✓+	✓+	✓+	✓+	✓+	✓+
	9/16"	✓	✓	✓+	✓+	✓+	✓+
	5/8"	✓	✓	✓+	✓+	✓+	✓+
	11/16"	✓	✓	✓	✓	✓+	✓+
	3/4"	✓	✓	✓	✓	✓+	✓+
	7/8"			✓	✓	✓	✓
	1"					✓	✓
	1-1/8"						
MATERIAL	High Reinforced Concrete	✓	✓	✓	✓	✓+	✓+
	Concrete, Granite, Solid Brick	✓+	✓+	✓+	✓+	✓+	✓+
	Hollow Brick Ties	✓	✓+	✓	✓	✓	✓
	Weight	5.3 lbs	5.3 lbs	6.6 lbs	7 lbs	8.7 lbs	8.8 lbs
	Chisel Function			Yes	Yes	Yes	Yes
FEATURES	AVR						Yes
	DRS				Yes		
	Connection End	SDS plus	SDS plus	SDS plus	SDS plus	SDS plus	SDS plus

✓ Possible
✓+ Optimal
AVR Active Vibration Reduction
DRS On-board Dust Removal System

TOOL SELECTION - DRILL

Remember the probing questions!

1.) What are you doing with the tool?

2.) What size holes do you typically drill?

3.) What is the largest hole you would drill?

4.) Do you have power at the jobsite? (or do you need a battery)

5.) Do you ever need the chipping function?

TOOL SELECTOR FOR CORDED ROTARIES

		TE 50-AVR	TE 60-AVR	TE 60-ATC/AVR	TE 70-AVR	TE 70-ATC/AVR
TOOL						
DRILL BIT DIAMETER	½"	✓	✓	✓	✓+	✓
	9/16"	✓	✓	✓	✓+	✓
	5/8"	✓+	✓	✓	✓+	✓
	11/16"	✓+	✓	✓	✓+	✓
	¾"	✓+	✓+	✓+	✓+	✓+
	7/8"	✓+	✓+	✓+	✓+	✓+
	1"	✓+	✓+	✓+	✓+	✓+
	1-1/8"	✓+	✓+	✓+	✓+	✓+
	1-¼"	✓+	✓+	✓+	✓+	✓+
	1-3/8"	✓	✓+	✓+	✓+	✓+
	1-½"	✓	✓+	✓+	✓+	✓+
	1-9/16"	✓	✓+	✓+	✓+	✓+
	1-¾"				✓	✓+
	2"				✓	✓+
	2-1/16"					✓
	2-1/8"					
MATERIAL	High Reinforced Concrete	✓+	✓+	✓+	✓+	✓+
	Concrete, Granite, Solid Brick	✓+	✓+	✓+	✓+	✓+
Weight		13.4 lbs	13.9 lbs	16.3 lbs	16.9 lbs	19.6 lbs
Chisel Function		Yes	Yes	Yes	Yes	Yes
FEATURES	ATC			Yes		Yes
	AVR	Yes	Yes	Yes	Yes	Yes
Connection End		SDS max	SDS max	SDS max	SDS max	SDS max

✓ Possible
✓+ Optimal
ATC Active Torque Control
AVR Active Vibration Reduction

TOOL SELECTION - BREAKER

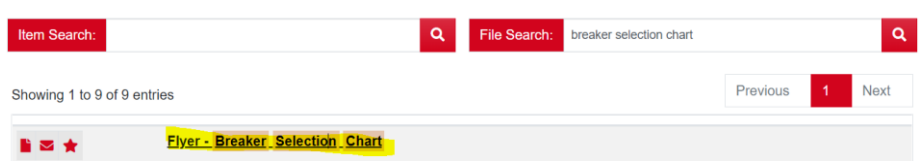
How do you select the correct breaker for a customer?

- Start with open probes.
- Where are you using the tool (zone – see selector)?
- What base material are you working with?
- How thick is the base material?
- Is this for concrete breaking or surface preparation?
- Do you have power at your job (determine if battery tool is needed)?
- Do you need to do any drilling with this tool?

You can now select the correct tool

TOOL SELECTION - BREAKER

Go to myProductSupport > File search side type “Breaker selection chart” > click to view selection chart



FEATURES AND BENEFITS

ATC – Active Torque Control

Stops drill rotation & stops motor

AVR – Active Vibration Reduction

Reduces vibration back to operator

DRS – Dust Removal System

Removes most dust after drilling or demolition

Service Indicator & Power Reduction Button

(50%)

DRS Video

ATC Video

SUMMARY

- **Drilling Modes**
  - Rotation only for wood or steel
  - Rotation and hammer for concrete and masonry
  - Hammer only for breaking up concrete or masonry
- **Hammer Action**
  - Electro-Pneumatic – pockets of air
  - Cam Action – metal to metal contact
- **Connection Ends** – TM, TE-C+, TE-Y, TE-S & TE-H
- **Drill Bit Selection**
  - Determine connection end
  - Determine diameter and working length
- **Chisel Selection**
  - Determine connection end
  - Determine overall length and application
- **Drill Selection**
  - Optimum and total bit ranges
- **Features and Benefits**
  - ATC, AVR, DRS

THANK YOU