ECONOMICAL & EXCELLENCE
IN HOLE MAKING

SWIFT DRILL™

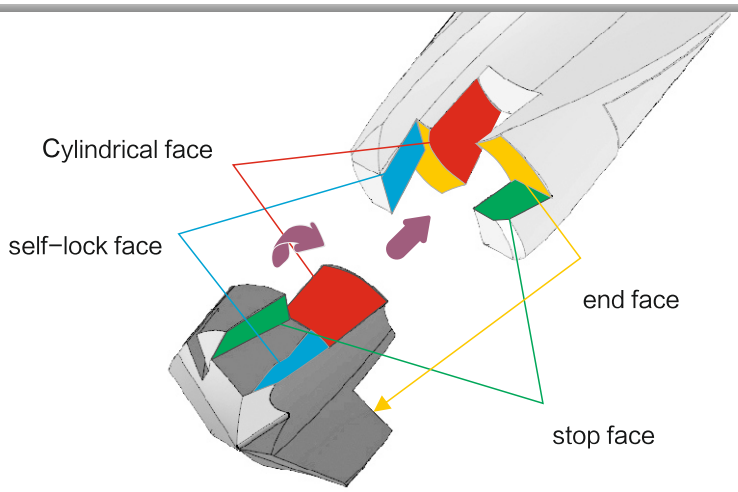
EcoCut Machining Solutions

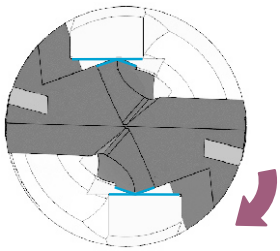
HI SPEED EXCHANGEABLE CARBIDE HEAD DRILLS

EcoCut

CONTENTS

Innovation Self-Locked Clamping System





Centering by cylindrical faces

The cutting head can be self−locked with toolholder while inserted due to its seat elastic deformation

Axial drill fore is transferred to toolholder by end faces

Drill torque is transferred to toolholder by stop faces

No Set-up Time for Changing Cutting Head

The cutting head can be changed in the machine tool,
No need to take the toolholder out from the spindle

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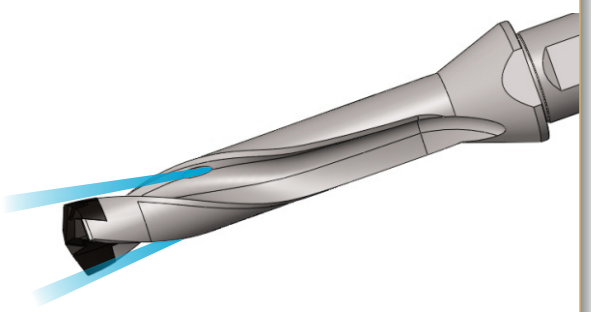
Perfectly Polished Toolholders

Perfectly polished tool holder flutes easily evacuate the chips from cutting head.

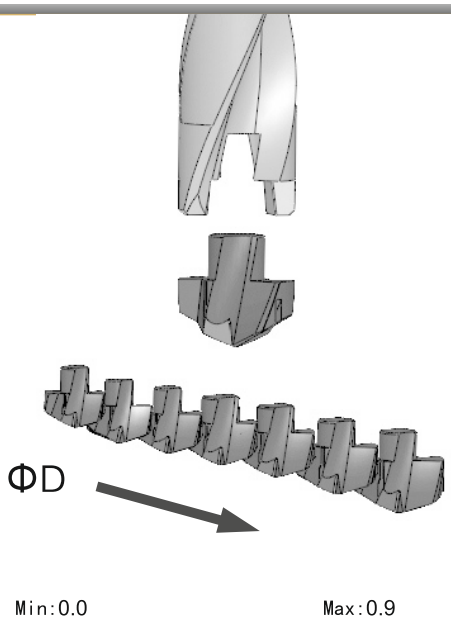
Toolholders with Coolant

Coolant makes cutting head life much longer and also high pressure cooling liquid pushes chips to evacuate quickly



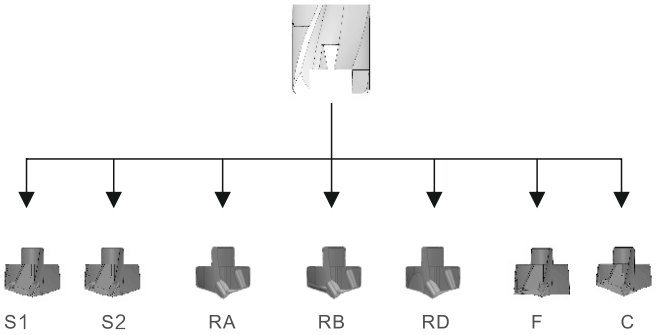
Interchangeability and Flexibility

Different cutting diameter heads can be fixed into one toolholder so as to reduce the number of toolholder, and cutting heads and toolholders are interchangeable totally



Different Drilling Edges are Avaiable

StandardS1,StandardS2,SpecialRA, SpecialR1/A,SpecialRB,SpecialRD, flat F and self−centering C cutting heads are available



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How To Attach Cutting Heads (Tip Mono Tip Line)

1

Fix drill holder on arbor For cutting head exchange,fix arbor on the machine or
set on toolpresetter

2

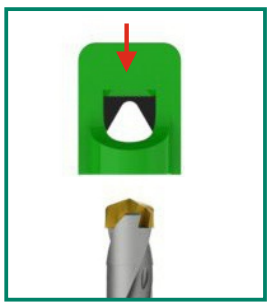
Remove dust using air blast

3

Put a cutting head into drill holder.(Use gloves to protect your hand from any danger)

4

Turn lightly in a clockwise direction (Use gloves to protect your hand from any danger)

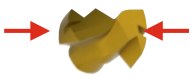


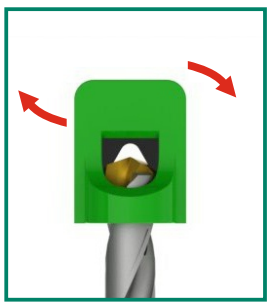
5

Set the wrench properly

6

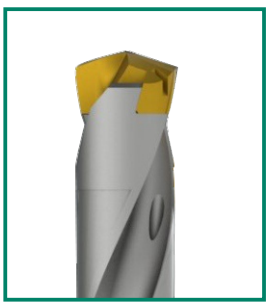
Make sure the wrench fits with cutting head's slot for the wrench





7

Turn the wrench in a clockwise direction slowly, then turn strongly while passing self-locked face untill cutting head won't move



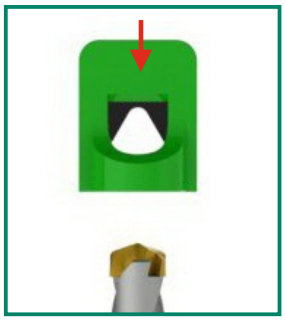
8

Complete

How To Detach Cutting Heads (Mono Tip Line)

1

Remove dust from cutting head using air blast

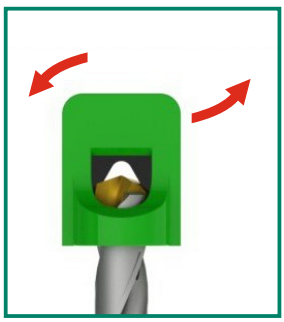


2

Set the wrench roperly

3

Fit the wrench to cutting head slot



4

Turn the wrench in a counter-clockwise direction

5

Once self-lock is released,cutting head can be turned by fingers (Use gloves to protect your hand from any danger)

6

Remove cutting head (Use gloves to protect your hand from any danger)

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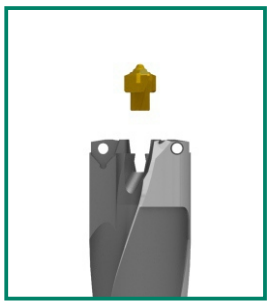
How To Attach Cutting Heads (Multi Tip Line)

1

Fix drill holder on arbor For cutting head exchange,fix arbor on the machine or set on toolpresetter

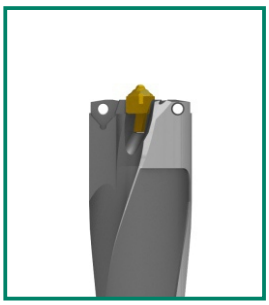
2

Remove dust using air blast



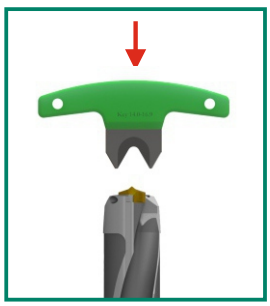
3

Put a cutting head into drill holder.(Use gloves to protect your hand from any danger)



4

Turn lightly in a clockwise direction (Use gloves to protect your hand from any danger)

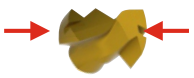


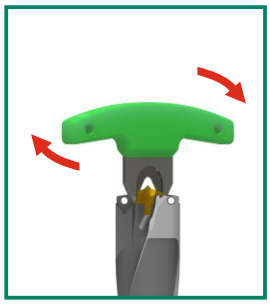
5

Set the wrench properly

6

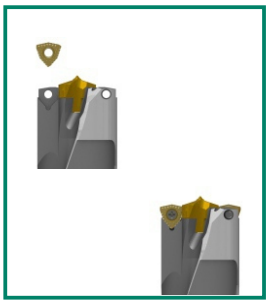
Make sure the wrench fits with cutting head's slot for the wrench





7

Turn the wrench in a clockwise direction slowly, then turn strongly while passing self-locked face untill cutting head won't move



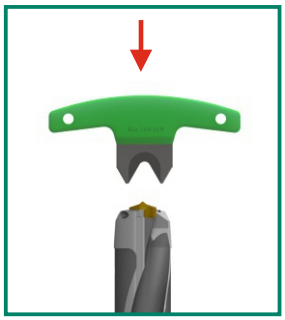
8

Take two side inserts into the seats,and tighten the screws with the wrench

How To Detach Cutting Heads (Multi Tip Line)

1

Remove dust from cutting head using air blast

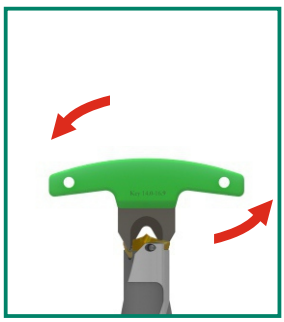


2

Set the wrench roperly

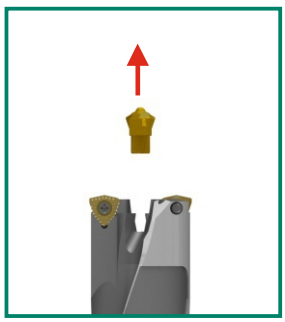
3

Fit the wrench to cutting head slot



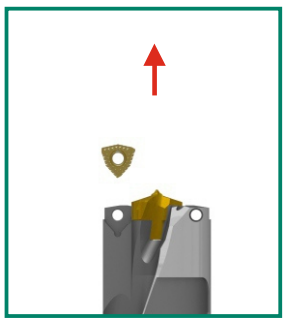
4

Turn the wrench in a counter-clockwise direction



5

Once self-lock is released,cutting head can be turned by fingers and remove cutting head (Use gloves to protect your hand from any danger)



6

Remove two side inserts with the wrench

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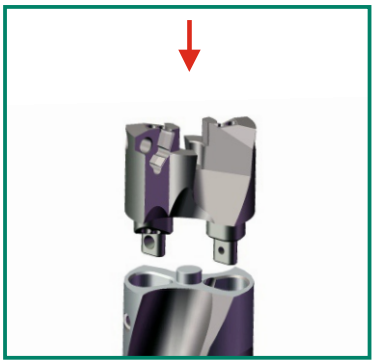
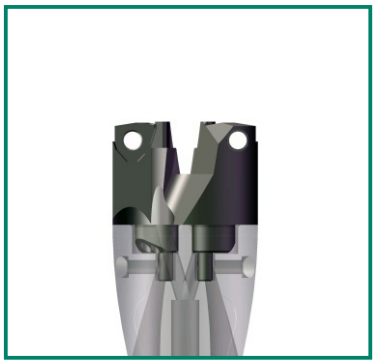
How To Fix The Modular Tool Holder (Multi Tip Line)



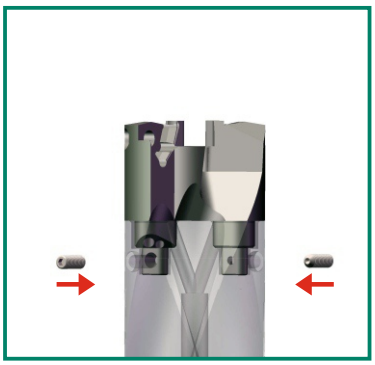
1

Take the cutting unit to aim at the holder unit



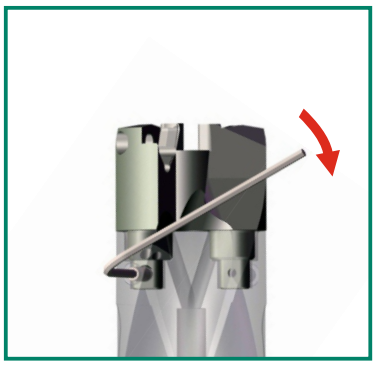
2

Put the cutting unit into the holder unit by their interface



3

Screw two screws into two screw holes

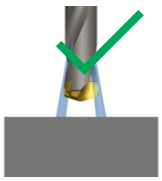


4

Tighten two screws with the wrench and make sure no any gap between each unit's interfaces

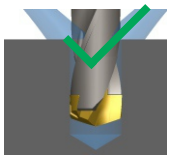
Coolant

1



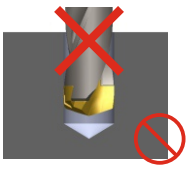
Strongly recommend to use inner coolant

2

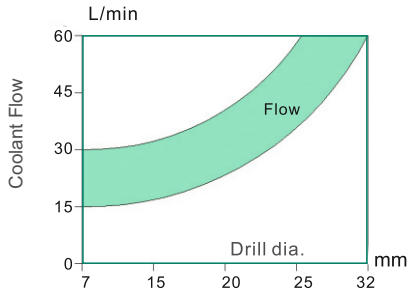


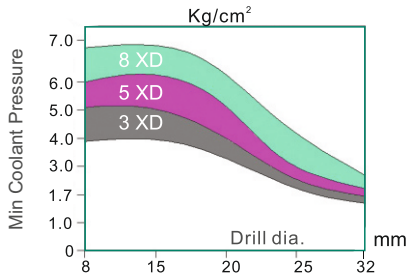
If only outer coolant, just drill holes for less than 3D

3



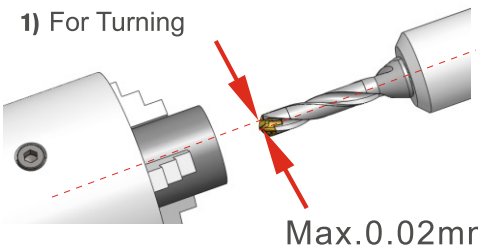
Strictly prohibited for dry drilling





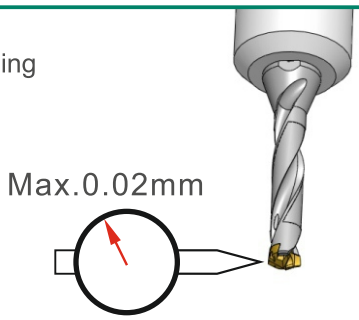
Usage Precautions core deviation

1) For Turning



Set deviation amount under0.02mm between the workpiece and the drill

2) For Drilling



Do not use any arbor with a deformed attachment surface.
Center of arbor deviation must be within 0.02mm

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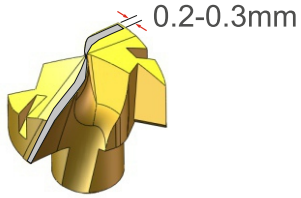
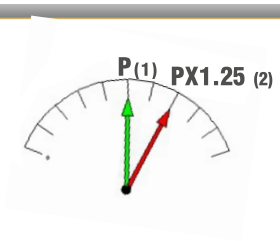
Indication of Cutting Head Wear



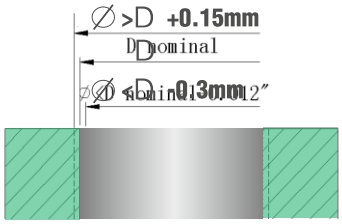
a) Wear Limit



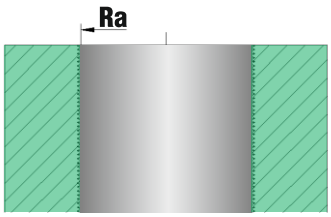
b) Power Restriction

(1) New cutting head

(2) Increase 25% for wore-out cutting head



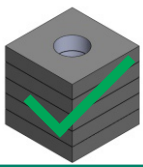
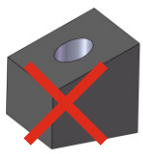
c) Diameter Change



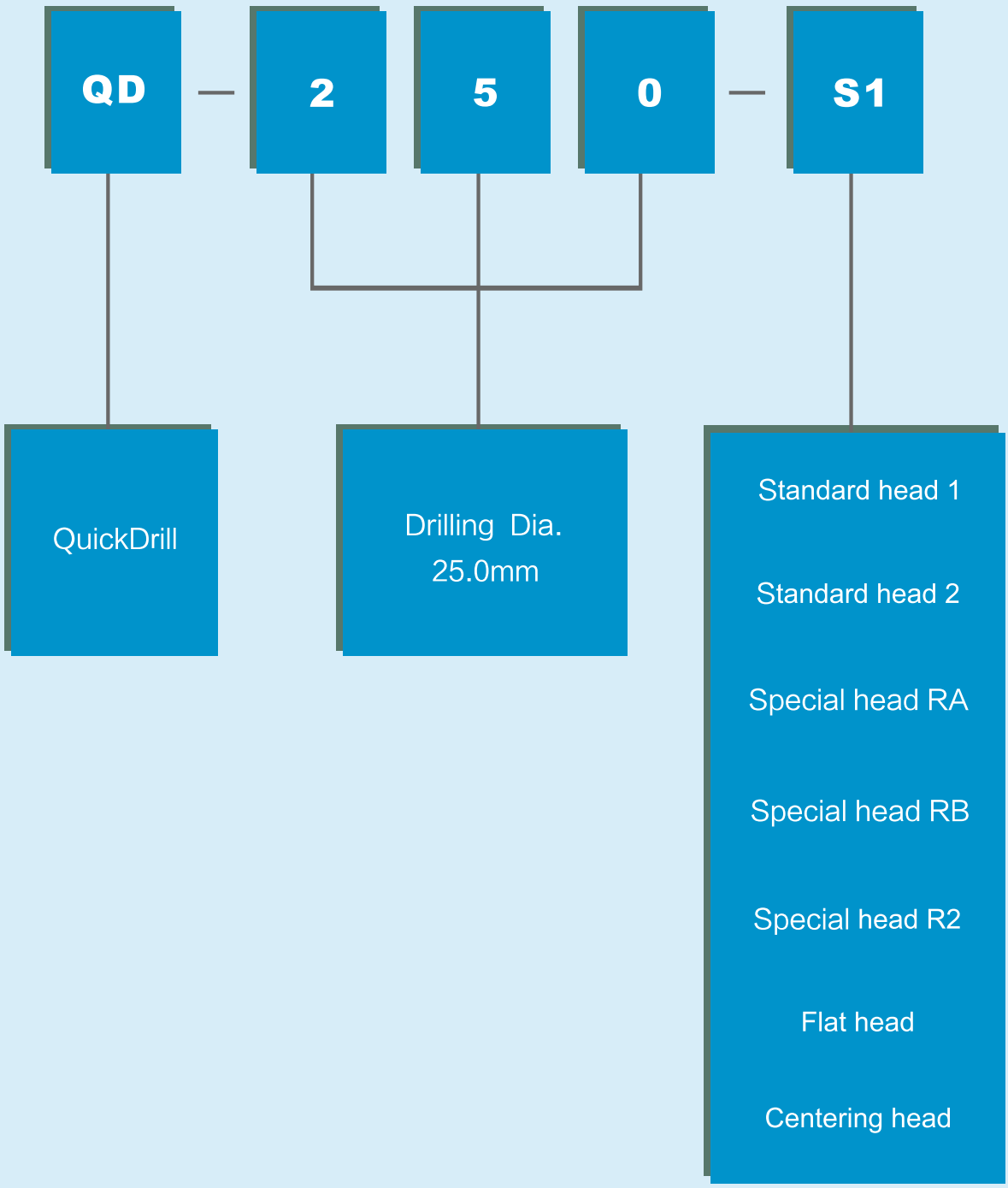
d) Surface Finish Deterioration

e) Vibration Noise Drastically Increases

Application

Application Recommendation	Workpiece Shape	Application Not Recommendation	Workpiece Shape
Flat Face Recommended		Hole Expansion Not Recommended	
Stacked Plates Recommended(absolutely don't move between plates)		Slanted Surface Not Recommended	
Concave Surface Recommended(reduce a half of feed tate as narmal)		Half Cylindrical Not Recommended	
Pipe Material Recommended		Cored Hole Not Recommended	

Mono Tip Line Drilling Head Ordering Code S



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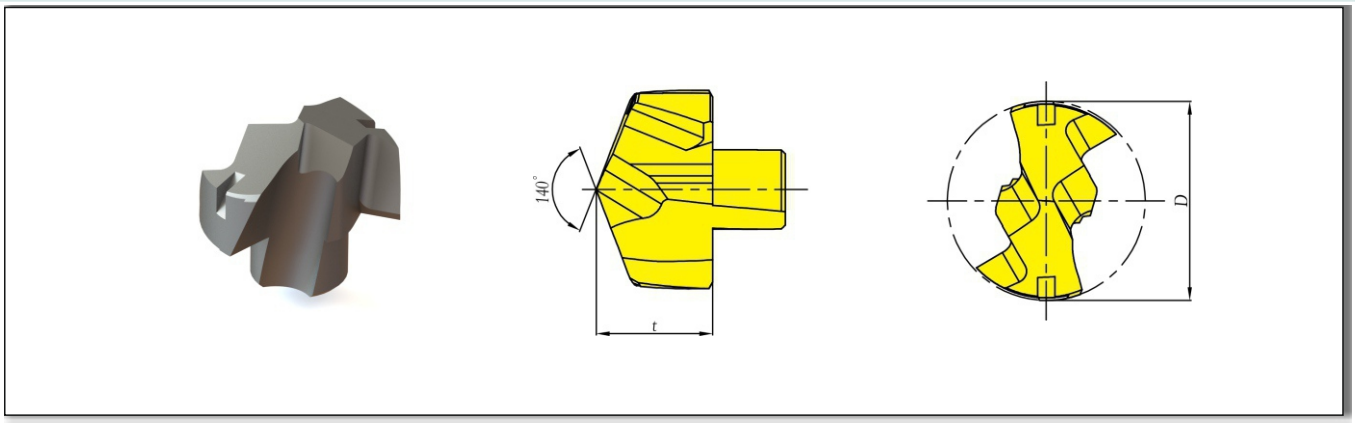
Standard Drilling Head S1

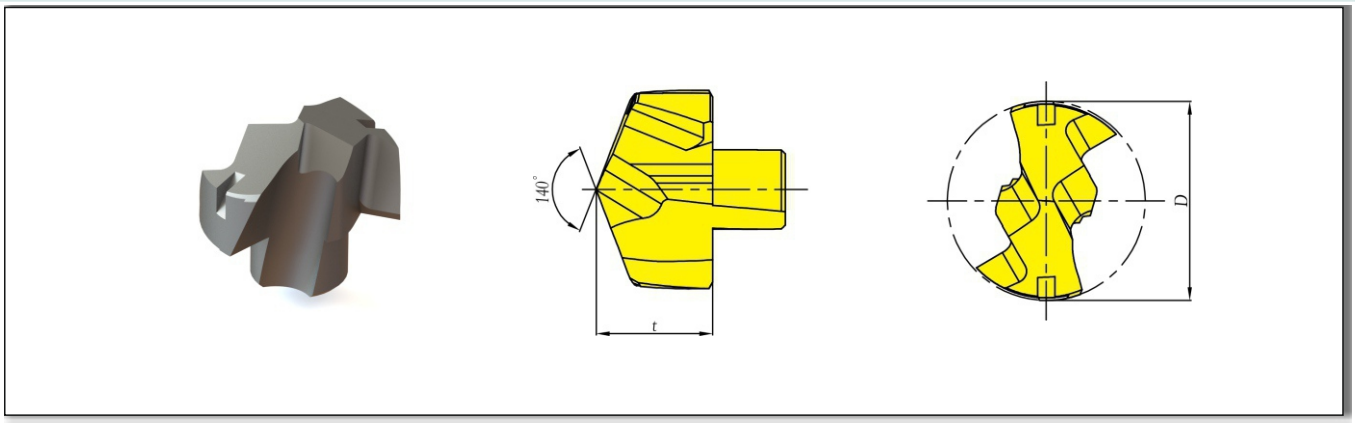


Order No.	Dimensions(mm)		tool holders
	D	t	
QD-080-S1	8.0	5.4	QD080/089-12-..D-..
QD-081-S1	8.1	5.4	
QD-082-S1	8.2	5.4	
QD-083-S1	8.3	5.4	
QD-084-S1	8.4	5.4	
QD-085-S1	8.5	5.4	
QD-086-S1	8.6	5.4	
QD-087-S1	8.7	5.4	
QD-088-S1	8.8	5.4	
QD-089-S1	8.9	5.4	
QD-090-S1	9.0	5.8	QD090/099-12-..D-..
QD-091-S1	9.1	5.8	
QD-092-S1	9.2	5.8	
QD-093-S1	9.3	5.8	
QD-094-S1	9.4	5.8	
QD-095-S1	9.5	5.8	
QD-096-S1	9.6	5.8	
QD-097-S1	9.7	5.8	
QD-098-S1	9.8	5.8	
QD-099-S1	9.9	5.8	
QD-100-S1	10.0	6.2	QD100/109-16-..D-..
QD-101-S1	10.1	6.2	
QD-102-S1	10.2	6.2	
QD-103-S1	10.3	6.2	
QD-104-S1	10.4	6.2	
QD-105-S1	10.5	6.2	
QD-106-S1	10.6	6.2	
QD-107-S1	10.7	6.2	
QD-108-S1	10.8	6.2	
QD-109-S1	10.9	6.2	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-110-S1	11.0	6.6	QD110/119-16-..D-..
QD-111-S1	11.1	6.6	
QD-112-S1	11.2	6.6	
QD-113-S1	11.3	6.6	
QD-114-S1	11.4	6.6	
QD-115-S1	11.5	6.6	
QD-116-S1	11.6	6.6	
QD-117-S1	11.7	6.6	
QD-118-S1	11.8	6.6	
QD-119-S1	11.9	6.6	
QD-120-S1	12.0	7.0	QD120/129-16-..D-..
QD-121-S1	12.1	7.0	
QD-122-S1	12.2	7.0	
QD-123-S1	12.3	7.0	
QD-124-S1	12.4	7.0	
QD-125-S1	12.5	7.0	
QD-126-S1	12.6	7.0	
QD-127-S1	12.7	7.0	
QD-128-S1	12.8	7.0	
QD-129-S1	12.9	7.0	
QD-130-S1	13.0	7.6	QD130/139-16-..D-..
QD-131-S1	13.1	7.6	
QD-132-S1	13.2	7.6	
QD-133-S1	13.3	7.6	
QD-134-S1	13.4	7.6	
QD-135-S1	13.5	7.6	
QD-136-S1	13.6	7.6	
QD-137-S1	13.7	7.6	
QD-138-S1	13.8	7.6	
QD-139-S1	13.9	7.6	

Recommend S1 cutting head to be used for middle and high carbon steel, alloy steel,nodular cast iron(specially for less than 5D)

Standard Drilling Head S1



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-140-S1	14.0	8.1	QD140/149-16-..D-..
QD-141-S1	14.1	8.1	
QD-142-S1	14.2	8.1	
QD-143-S1	14.3	8.1	
QD-144-S1	14.4	8.1	
QD-145-S1	14.5	8.1	
QD-146-S1	14.6	8.1	
QD-147-S1	14.7	8.1	
QD-148-S1	14.8	8.1	
QD-149-S1	14.9	8.1	
QD-150-S1	15.0	8.7	QD150/159-20-..D-..
QD-151-S1	15.1	8.7	
QD-152-S1	15.2	8.7	
QD-153-S1	15.3	8.7	
QD-154-S1	15.4	8.7	
QD-155-S1	15.5	8.7	
QD-156-S1	15.6	8.7	
QD-157-S1	15.7	8.7	
QD-158-S1	15.8	8.7	
QD-159-S1	15.9	8.7	
QD-160-S1	16.0	9.3	QD160/169-20-..D-..
QD-161-S1	16.1	9.3	
QD-162-S1	16.2	9.3	
QD-163-S1	16.3	9.3	
QD-164-S1	16.4	9.3	
QD-165-S1	16.5	9.3	
QD-166-S1	16.6	9.3	
QD-167-S1	16.7	9.3	
QD-168-S1	16.8	9.3	
QD-169-S1	16.9	9.3	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-170-S1	17.0	9.9	QD170/179-20-..D-..
QD-171-S1	17.1	9.9	
QD-172-S1	17.2	9.9	
QD-173-S1	17.3	9.9	
QD-174-S1	17.4	9.9	
QD-175-S1	17.5	9.9	
QD-176-S1	17.6	9.9	
QD-177-S1	17.7	9.9	
QD-178-S1	17.8	9.9	
QD-179-S1	17.9	9.9	
QD-180-S1	18.0	10.5	QD180/189-25-..D-..
QD-181-S1	18.1	10.5	
QD-182-S1	18.2	10.5	
QD-183-S1	18.3	10.5	
QD-184-S1	18.4	10.5	
QD-185-S1	18.5	10.5	
QD-186-S1	18.6	10.5	
QD-187-S1	18.7	10.5	
QD-188-S1	18.8	10.5	
QD-189-S1	18.9	10.5	
QD-190-S1	19.0	11.0	QD190/199-25-..D-..
QD-191-S1	19.1	11.0	
QD-192-S1	19.2	11.0	
QD-193-S1	19.3	11.0	
QD-194-S1	19.4	11.0	
QD-195-S1	19.5	11.0	
QD-196-S1	19.6	11.0	
QD-197-S1	19.7	11.0	
QD-198-S1	19.8	11.0	
QD-199-S1	19.9	11.0	

Recommend S1 cutting head to be used for middle and high carbon steel, alloy steel,nodular cast iron(specially for less than 5D)

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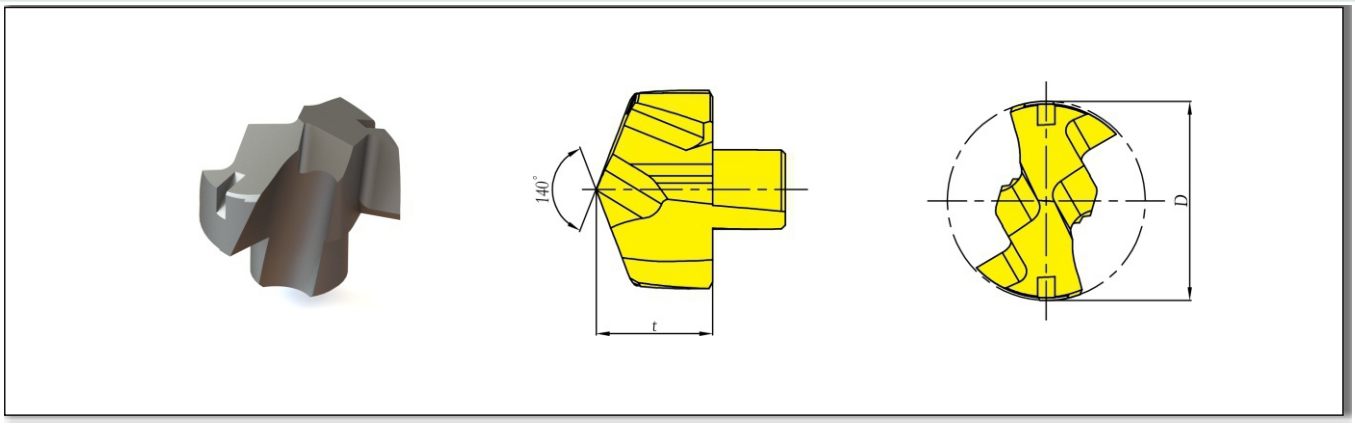
Standard Drilling Head S1

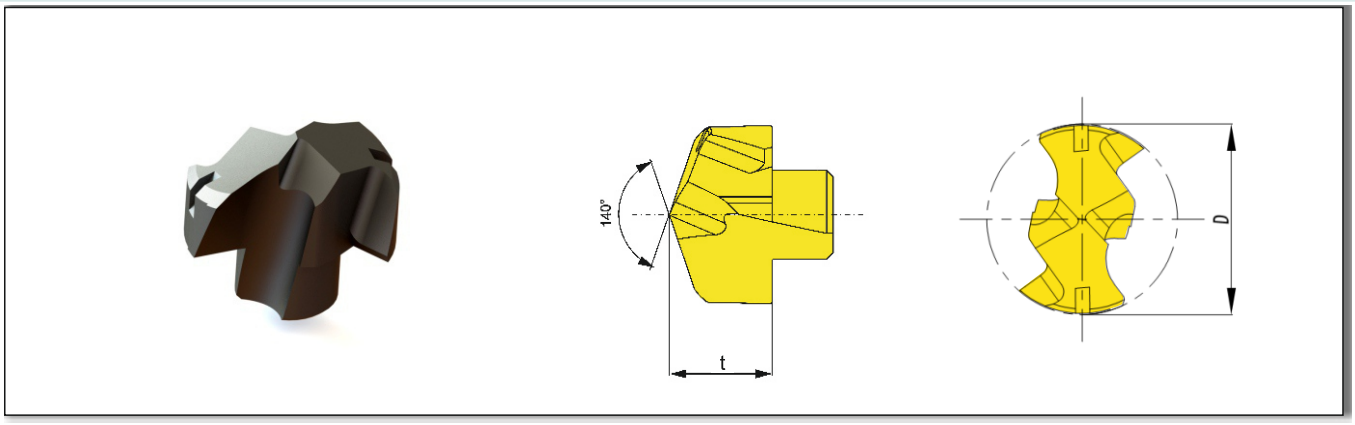


Order No.	Dimensions(mm)		tool holders
	D	t	
QD-200-S1	20.0	11.6	QD200/209-25-..D-..
QD-201-S1	20.1	11.6	
QD-202-S1	20.2	11.6	
QD-203-S1	20.3	11.6	
QD-204-S1	20.4	11.6	
QD-205-S1	20.5	11.6	
QD-206-S1	20.6	11.6	
QD-207-S1	20.7	11.6	
QD-208-S1	20.8	11.6	
QD-209-S1	20.9	11.6	
QD-210-S1	21.0	12.1	QD210/219-25-..D-..
QD-211-S1	21.1	12.1	
QD-212-S1	21.2	12.1	
QD-213-S1	21.3	12.1	
QD-214-S1	21.4	12.1	
QD-215-S1	21.5	12.1	
QD-216-S1	21.6	12.1	
QD-217-S1	21.7	12.1	
QD-218-S1	21.8	12.1	
QD-219-S1	21.9	12.1	
QD-220-S1	22.0	12.7	QD220/229-25-..D-..
QD-221-S1	22.1	12.7	
QD-222-S1	22.2	12.7	
QD-223-S1	22.3	12.7	
QD-224-S1	22.4	12.7	
QD-225-S1	22.5	12.7	
QD-226-S1	22.6	12.7	
QD-227-S1	22.7	12.7	
QD-228-S1	22.8	12.7	
QD-229-S1	22.9	12.7	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-230-S1	23.0	13.3	QD230/239-32-..D-..
QD-231-S1	23.1	13.3	
QD-232-S1	23.2	13.3	
QD-233-S1	23.3	13.3	
QD-234-S1	23.4	13.3	
QD-235-S1	23.5	13.3	
QD-236-S1	23.6	13.3	
QD-237-S1	23.7	13.3	
QD-238-S1	23.8	13.3	
QD-239-S1	23.9	13.3	
QD-240-S1	24.0	13.9	QD240/249-32-..D-..
QD-241-S1	24.1	13.9	
QD-242-S1	24.2	13.9	
QD-243-S1	24.3	13.9	
QD-244-S1	24.4	13.9	
QD-245-S1	24.5	13.9	
QD-246-S1	24.6	13.9	
QD-247-S1	24.7	13.9	
QD-248-S1	24.8	13.9	
QD-249-S1	24.9	13.9	
QD-250-S1	25.0	14.5	QD250/260-32-..D-..
QD-251-S1	25.1	14.5	
QD-252-S1	25.2	14.5	
QD-253-S1	25.3	14.5	
QD-254-S1	25.4	14.5	
QD-255-S1	25.5	14.5	
QD-256-S1	25.6	14.5	
QD-257-S1	25.7	14.5	
QD-258-S1	25.8	14.5	
QD-259-S1	25.9	14.5	
QD-260-S1	26.0	14.5	

Recommend S1 cutting head to be used for middle and high carbon steel, alloy steel,nodular cast iron(specially for less than 5D)

Standard Drilling Head S2



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-080-S2	8.0	5.4	QD080/089-12-..D-..
QD-081-S2	8.1	5.4	
QD-082-S2	8.2	5.4	
QD-083-S2	8.3	5.4	
QD-084-S2	8.4	5.4	
QD-085-S2	8.5	5.4	
QD-086-S2	8.6	5.4	
QD-087-S2	8.7	5.4	
QD-088-S2	8.8	5.4	
QD-089-S2	8.9	5.4	
QD-090-S2	9.0	5.8	QD090/099-12-..D-..
QD-091-S2	9.1	5.8	
QD-092-S2	9.2	5.8	
QD-093-S2	9.3	5.8	
QD-094-S2	9.4	5.8	
QD-095-S2	9.5	5.8	
QD-096-S2	9.6	5.8	
QD-097-S2	9.7	5.8	
QD-098-S2	9.8	5.8	
QD-099-S2	9.9	5.8	
QD-100-S2	10.0	6.2	QD100/109-16-..D-..
QD-101-S2	10.1	6.2	
QD-102-S2	10.2	6.2	
QD-103-S2	10.3	6.2	
QD-104-S2	10.4	6.2	
QD-105-S2	10.5	6.2	
QD-106-S2	10.6	6.2	
QD-107-S2	10.7	6.2	
QD-108-S2	10.8	6.2	
QD-109-S2	10.9	6.2	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-110-S2	11.0	6.6	QD110/119-16-..D-..
QD-111-S2	11.1	6.6	
QD-112-S2	11.2	6.6	
QD-113-S2	11.3	6.6	
QD-114-S2	11.4	6.6	
QD-115-S2	11.5	6.6	
QD-116-S2	11.6	6.6	
QD-117-S2	11.7	6.6	
QD-118-S2	11.8	6.6	
QD-119-S2	11.9	6.6	
QD-120-S2	12.0	7.0	QD120/129-16-..D-..
QD-121-S2	12.1	7.0	
QD-122-S2	12.2	7.0	
QD-123-S2	12.3	7.0	
QD-124-S2	12.4	7.0	
QD-125-S2	12.5	7.0	
QD-126-S2	12.6	7.0	
QD-127-S2	12.7	7.0	
QD-128-S2	12.8	7.0	
QD-129-S2	12.9	7.0	
QD-130-S2	13.0	7.6	QD130/139-16-..D-..
QD-131-S2	13.1	7.6	
QD-132-S2	13.2	7.6	
QD-133-S2	13.3	7.6	
QD-134-S2	13.4	7.6	
QD-135-S2	13.5	7.6	
QD-136-S2	13.6	7.6	
QD-137-S2	13.7	7.6	
QD-138-S2	13.8	7.6	
QD-139-S2	13.9	7.6	

Recommend S2 cutting head to be used for grey iron cost, nodular cast iron

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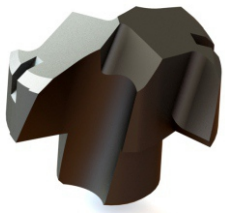
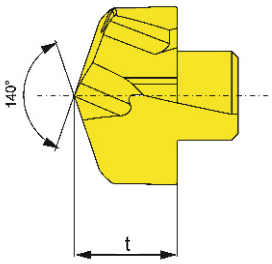
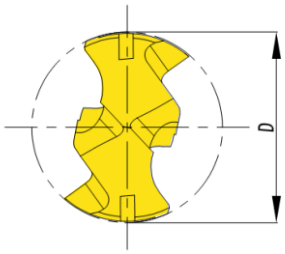
Standard Drilling Head S2





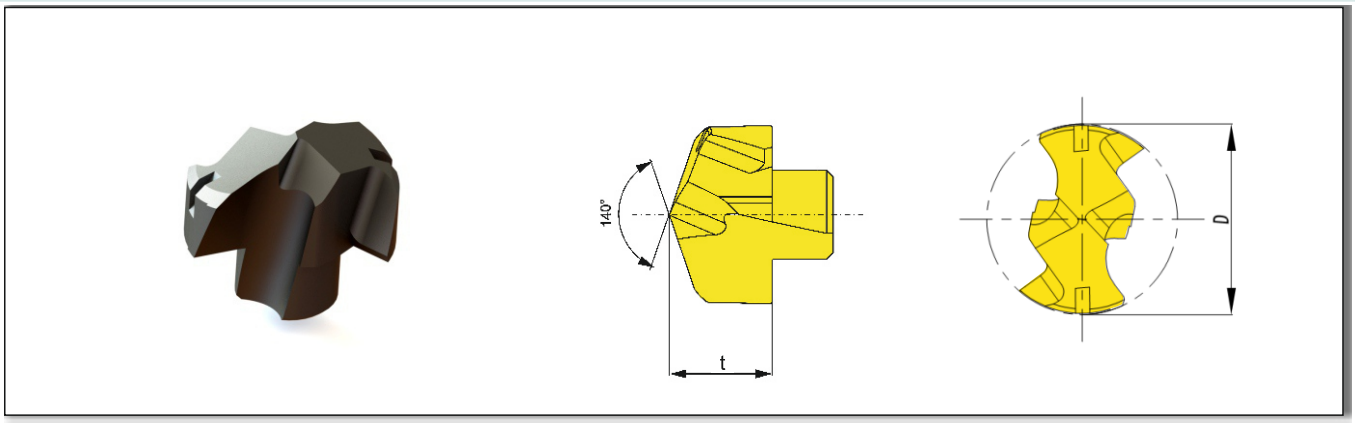


Order No.	Dimensions(mm)		tool holders
	D	t	
QD-140-S2	14.0	8.1	QD140/149-16-..D-..
QD-141-S2	14.1	8.1	
QD-142-S2	14.2	8.1	
QD-143-S2	14.3	8.1	
QD-144-S2	14.4	8.1	
QD-145-S2	14.5	8.1	
QD-146-S2	14.6	8.1	
QD-147-S2	14.7	8.1	
QD-148-S2	14.8	8.1	
QD-149-S2	14.9	8.1	
QD-150-S2	15.0	8.7	QD150/159-20-..D-..
QD-151-S2	15.1	8.7	
QD-152-S2	15.2	8.7	
QD-153-S2	15.3	8.7	
QD-154-S2	15.4	8.7	
QD-155-S2	15.5	8.7	
QD-156-S2	15.6	8.7	
QD-157-S2	15.7	8.7	
QD-158-S2	15.8	8.7	
QD-159-S2	15.9	8.7	
QD-160-S2	16.0	9.3	QD160/169-20-..D-..
QD-161-S2	16.1	9.3	
QD-162-S2	16.2	9.3	
QD-163-S2	16.3	9.3	
QD-164-S2	16.4	9.3	
QD-165-S2	16.5	9.3	
QD-166-S2	16.6	9.3	
QD-167-S2	16.7	9.3	
QD-168-S2	16.8	9.3	
QD-169-S2	16.9	9.3	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-170-S2	17.0	9.9	QD170/179-20-..D-..
QD-171-S2	17.1	9.9	
QD-172-S2	17.2	9.9	
QD-173-S2	17.3	9.9	
QD-174-S2	17.4	9.9	
QD-175-S2	17.5	9.9	
QD-176-S2	17.6	9.9	
QD-177-S2	17.7	9.9	
QD-178-S2	17.8	9.9	
QD-179-S2	17.9	9.9	
QD-180-S2	18.0	10.5	QD180/189-25-..D-..
QD-181-S2	18.1	10.5	
QD-182-S2	18.2	10.5	
QD-183-S2	18.3	10.5	
QD-184-S2	18.4	10.5	
QD-185-S2	18.5	10.5	
QD-186-S2	18.6	10.5	
QD-187-S2	18.7	10.5	
QD-188-S2	18.8	10.5	
QD-189-S2	18.9	10.5	
QD-190-S2	19.0	11.0	QD190/199-25-..D-..
QD-191-S2	19.1	11.0	
QD-192-S2	19.2	11.0	
QD-193-S2	19.3	11.0	
QD-194-S2	19.4	11.0	
QD-195-S2	19.5	11.0	
QD-196-S2	19.6	11.0	
QD-197-S2	19.7	11.0	
QD-198-S2	19.8	11.0	
QD-199-S2	19.9	11.0	

Recommend S2 cutting head to be used for grey iron cost, nodular cast iron

Standard Drilling Head S2



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-200-S2	20.0	11.6	QD200/209-25-..D-..
QD-201-S2	20.1	11.6	
QD-202-S2	20.2	11.6	
QD-203-S2	20.3	11.6	
QD-204-S2	20.4	11.6	
QD-205-S2	20.5	11.6	
QD-206-S2	20.6	11.6	
QD-207-S2	20.7	11.6	
QD-208-S2	20.8	11.6	
QD-209-S2	20.9	11.6	
QD-210-S2	21.0	12.1	QD210/219-25-..D-..
QD-211-S2	21.1	12.1	
QD-212-S2	21.2	12.1	
QD-213-S2	21.3	12.1	
QD-214-S2	21.4	12.1	
QD-215-S2	21.5	12.1	
QD-216-S2	21.6	12.1	
QD-217-S2	21.7	12.1	
QD-218-S2	21.8	12.1	
QD-219-S2	21.9	12.1	
QD-220-S2	22.0	12.7	QD220/229-25-..D-..
QD-221-S2	22.1	12.7	
QD-222-S2	22.2	12.7	
QD-223-S2	22.3	12.7	
QD-224-S2	22.4	12.7	
QD-225-S2	22.5	12.7	
QD-226-S2	22.6	12.7	
QD-227-S2	22.7	12.7	
QD-228-S2	22.8	12.7	
QD-229-S2	22.9	12.7	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-230-S2	23.0	13.3	QD230/239-32-..D-..
QD-231-S2	23.1	13.3	
QD-232-S2	23.2	13.3	
QD-233-S2	23.3	13.3	
QD-234-S2	23.4	13.3	
QD-235-S2	23.5	13.3	
QD-236-S2	23.6	13.3	
QD-237-S2	23.7	13.3	
QD-238-S2	23.8	13.3	
QD-239-S2	23.9	13.3	
QD-240-S2	24.0	13.9	QD240/249-32-..D-..
QD-241-S2	24.1	13.9	
QD-242-S2	24.2	13.9	
QD-243-S2	24.3	13.9	
QD-244-S2	24.4	13.9	
QD-245-S2	24.5	13.9	
QD-246-S2	24.6	13.9	
QD-247-S2	24.7	13.9	
QD-248-S2	24.8	13.9	
QD-249-S2	24.9	13.9	
QD-250-S2	25.0	14.5	QD250/260-32-..D-..
QD-251-S2	25.1	14.5	
QD-252-S2	25.2	14.5	
QD-253-S2	25.3	14.5	
QD-254-S2	25.4	14.5	
QD-255-S2	25.5	14.5	
QD-256-S2	25.6	14.5	
QD-257-S2	25.7	14.5	
QD-258-S2	25.8	14.5	
QD-259-S2	25.9	14.5	
QD-260-S2	26.0	14.5	

Recommend S2 cutting head to be used for grey iron cost, nodular cast iron

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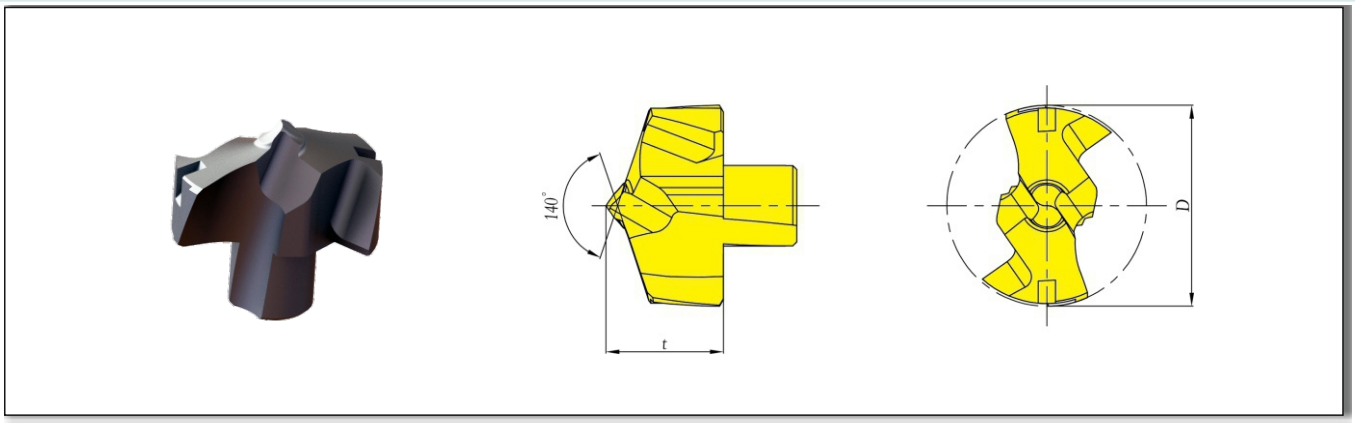
Special Drilling Head RA

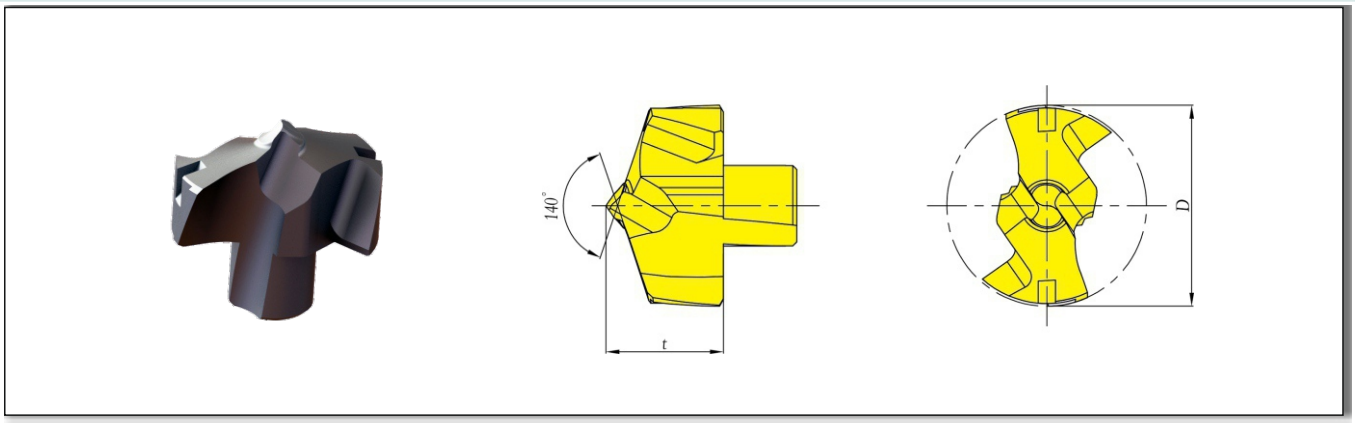


Order No.	Dimensions(mm)		tool holders
	D	t	
QD-080-RA	8.0	5.4	QD080/089-12-..D-..
QD-081-RA	8.1	5.4	
QD-082-RA	8.2	5.4	
QD-083-RA	8.3	5.4	
QD-084-RA	8.4	5.4	
QD-085-RA	8.5	5.4	
QD-086-RA	8.6	5.4	
QD-087-RA	8.7	5.4	
QD-088-RA	8.8	5.4	
QD-089-RA	8.9	5.4	
QD-090-RA	9.0	5.8	QD090/099-12-..D-..
QD-091-RA	9.1	5.8	
QD-092-RA	9.2	5.8	
QD-093-RA	9.3	5.8	
QD-094-RA	9.4	5.8	
QD-095-RA	9.5	5.8	
QD-096-RA	9.6	5.8	
QD-097-RA	9.7	5.8	
QD-098-RA	9.8	5.8	
QD-099-RA	9.9	5.8	
QD-100-RA	10.0	6.2	QD100/109-16-..D-..
QD-101-RA	10.1	6.2	
QD-102-RA	10.2	6.2	
QD-103-RA	10.3	6.2	
QD-104-RA	10.4	6.2	
QD-105-RA	10.5	6.2	
QD-106-RA	10.6	6.2	
QD-107-RA	10.7	6.2	
QD-108-RA	10.8	6.2	
QD-109-RA	10.9	6.2	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-110-RA	11.0	6.6	QD110/119-16-..D-..
QD-111-RA	11.1	6.6	
QD-112-RA	11.2	6.6	
QD-113-RA	11.3	6.6	
QD-114-RA	11.4	6.6	
QD-115-RA	11.5	6.6	
QD-116-RA	11.6	6.6	
QD-117-RA	11.7	6.6	
QD-118-RA	11.8	6.6	
QD-119-RA	11.9	6.6	
QD-120-RA	12.0	7.0	QD120/129-16-..D-..
QD-121-RA	12.1	7.0	
QD-122-RA	12.2	7.0	
QD-123-RA	12.3	7.0	
QD-124-RA	12.4	7.0	
QD-125-RA	12.5	7.0	
QD-126-RA	12.6	7.0	
QD-127-RA	12.7	7.0	
QD-128-RA	12.8	7.0	
QD-129-RA	12.9	7.0	
QD-130-RA	13.0	7.6	QD130/139-16-..D-..
QD-131-RA	13.1	7.6	
QD-132-RA	13.2	7.6	
QD-133-RA	13.3	7.6	
QD-134-RA	13.4	7.6	
QD-135-RA	13.5	7.6	
QD-136-RA	13.6	7.6	
QD-137-RA	13.7	7.6	
QD-138-RA	13.8	7.6	
QD-139-RA	13.9	7.6	

RA cutting head can drill with self-centering and less drill force and more advantages can be relfected with drilling middle & high carbon , ally steel etc. (espcially for more than 5D)

Special Drilling Head RA



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-140-RA	14.0	8.1	QD140/149-16-..D-..
QD-141-RA	14.1	8.1	
QD-142-RA	14.2	8.1	
QD-143-RA	14.3	8.1	
QD-144-RA	14.4	8.1	
QD-145-RA	14.5	8.1	
QD-146-RA	14.6	8.1	
QD-147-RA	14.7	8.1	
QD-148-RA	14.8	8.1	
QD-149-RA	14.9	8.1	
QD-150-RA	15.0	8.7	QD150/159-20-..D-..
QD-151-RA	15.1	8.7	
QD-152-RA	15.2	8.7	
QD-153-RA	15.3	8.7	
QD-154-RA	15.4	8.7	
QD-155-RA	15.5	8.7	
QD-156-RA	15.6	8.7	
QD-157-RA	15.7	8.7	
QD-158-RA	15.8	8.7	
QD-159-RA	15.9	8.7	
QD-160-RA	16.0	9.3	QD160/169-20-..D-..
QD-161-RA	16.1	9.3	
QD-162-RA	16.2	9.3	
QD-163-RA	16.3	9.3	
QD-164-RA	16.4	9.3	
QD-165-RA	16.5	9.3	
QD-166-RA	16.6	9.3	
QD-167-RA	16.7	9.3	
QD-168-RA	16.8	9.3	
QD-169-RA	16.9	9.3	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-170-RA	17.0	9.9	QD170/179-20-..D-..
QD-171-RA	17.1	9.9	
QD-172-RA	17.2	9.9	
QD-173-RA	17.3	9.9	
QD-174-RA	17.4	9.9	
QD-175-RA	17.5	9.9	
QD-176-RA	17.6	9.9	
QD-177-RA	17.7	9.9	
QD-178-RA	17.8	9.9	
QD-179-RA	17.9	9.9	
QD-180-RA	18.0	10.5	QD180/189-25-..D-..
QD-181-RA	18.1	10.5	
QD-182-RA	18.2	10.5	
QD-183-RA	18.3	10.5	
QD-184-RA	18.4	10.5	
QD-185-RA	18.5	10.5	
QD-186-RA	18.6	10.5	
QD-187-RA	18.7	10.5	
QD-188-RA	18.8	10.5	
QD-189-RA	18.9	10.5	
QD-190-RA	19.0	11.0	QD190/199-25-..D-..
QD-191-RA	19.1	11.0	
QD-192-RA	19.2	11.0	
QD-193-RA	19.3	11.0	
QD-194-RA	19.4	11.0	
QD-195-RA	19.5	11.0	
QD-196-RA	19.6	11.0	
QD-197-RA	19.7	11.0	
QD-198-RA	19.8	11.0	
QD-199-RA	19.9	11.0	

RA cutting head can drill with self-centering and less drill force and more advantages can be relfected with drilling middle & high carbon , ally steel etc. (espcially for more than 5D)

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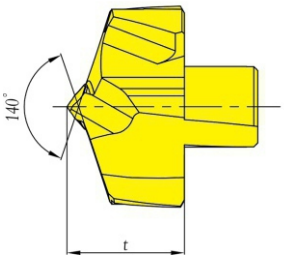
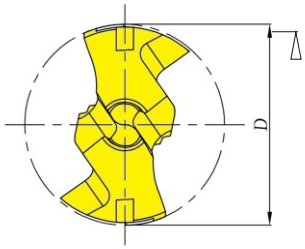
Special Drilling Head RA



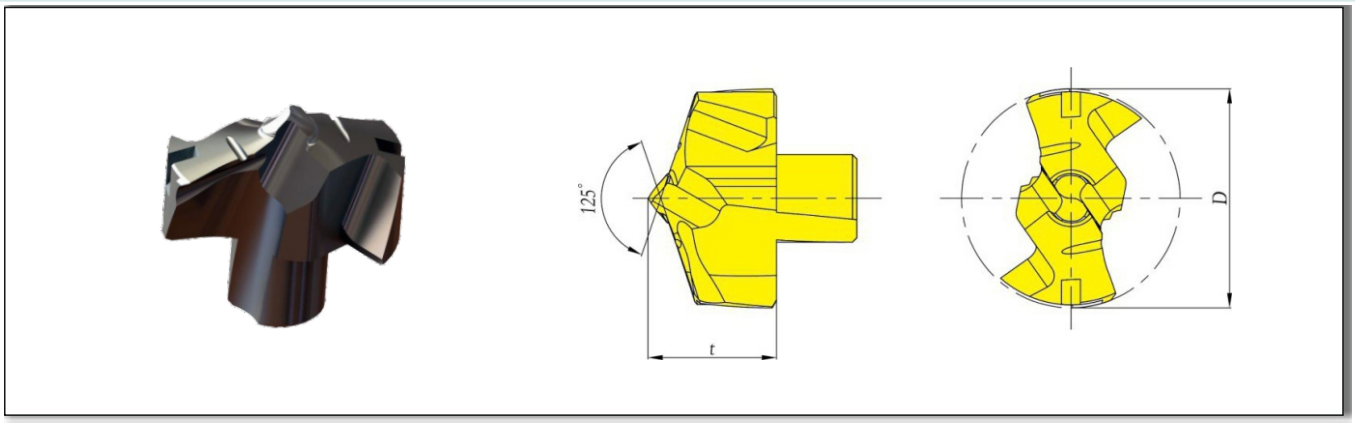


Order No.	Dimensions(mm)		tool holders
	D	t	
QD-200-RA	20.0	11.6	QD200/209-25-..D-..
QD-201-RA	20.1	11.6	
QD-202-RA	20.2	11.6	
QD-203-RA	20.3	11.6	
QD-204-RA	20.4	11.6	
QD-205-RA	20.5	11.6	
QD-206-RA	20.6	11.6	
QD-207-RA	20.7	11.6	
QD-208-RA	20.8	11.6	
QD-209-RA	20.9	11.6	
QD-210-RA	21.0	12.1	QD210/219-25-..D-..
QD-211-RA	21.1	12.1	
QD-212-RA	21.2	12.1	
QD-213-RA	21.3	12.1	
QD-214-RA	21.4	12.1	
QD-215-RA	21.5	12.1	
QD-216-RA	21.6	12.1	
QD-217-RA	21.7	12.1	
QD-218-RA	21.8	12.1	
QD-219-RA	21.9	12.1	
QD-220-RA	22.0	12.7	QD220/229-25-..D-..
QD-221-RA	22.1	12.7	
QD-222-RA	22.2	12.7	
QD-223-RA	22.3	12.7	
QD-224-RA	22.4	12.7	
QD-225-RA	22.5	12.7	
QD-226-RA	22.6	12.7	
QD-227-RA	22.7	12.7	
QD-228-RA	22.8	12.7	
QD-229-RA	22.9	12.7	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-230-RA	23.0	13.3	QD230/239-32-..D-..
QD-231-RA	23.1	13.3	
QD-232-RA	23.2	13.3	
QD-233-RA	23.3	13.3	
QD-234-RA	23.4	13.3	
QD-235-RA	23.5	13.3	
QD-236-RA	23.6	13.3	
QD-237-RA	23.7	13.3	
QD-238-RA	23.8	13.3	
QD-239-RA	23.9	13.3	
QD-240-RA	24.0	13.9	QD240/249-32-..D-..
QD-241-RA	24.1	13.9	
QD-242-RA	24.2	13.9	
QD-243-RA	24.3	13.9	
QD-244-RA	24.4	13.9	
QD-245-RA	24.5	13.9	
QD-246-RA	24.6	13.9	
QD-247-RA	24.7	13.9	
QD-248-RA	24.8	13.9	
QD-249-RA	24.9	13.9	
QD-250-RA	25.0	14.5	QD250/260-32-..D-..
QD-251-RA	25.1	14.5	
QD-252-RA	25.2	14.5	
QD-253-RA	25.3	14.5	
QD-254-RA	25.4	14.5	
QD-255-RA	25.5	14.5	
QD-256-RA	25.6	14.5	
QD-257-RA	25.7	14.5	
QD-258-RA	25.8	14.5	
QD-259-RA	25.9	14.5	
QD-260-RA	26.0	14.5	

RA cutting head can drill with self-centering and less drill force and more advantages can be relfected with drilling middle & high carbon , ally steel etc. (espcially for more than 5D)

Special Drilling Head RD



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-080-RD	8.0	5.4	QD080/089-12-..D-..
QD-081-RD	8.1	5.4	
QD-082-RD	8.2	5.4	
QD-083-RD	8.3	5.4	
QD-084-RD	8.4	5.4	
QD-085-RD	8.5	5.4	
QD-086-RD	8.6	5.4	
QD-087-RD	8.7	5.4	
QD-088-RD	8.8	5.4	
QD-089-RD	8.9	5.4	
QD-090-RD	9.0	5.8	QD090/099-12-..D-..
QD-091-RD	9.1	5.8	
QD-092-RD	9.2	5.8	
QD-093-RD	9.3	5.8	
QD-094-RD	9.4	5.8	
QD-095-RD	9.5	5.8	
QD-096-RD	9.6	5.8	
QD-097-RD	9.7	5.8	
QD-098-RD	9.8	5.8	
QD-099-RD	9.9	5.8	
QD-100-RD	10.0	6.2	QD100/109-16-..D-..
QD-101-RD	10.1	6.2	
QD-102-RD	10.2	6.2	
QD-103-RD	10.3	6.2	
QD-104-RD	10.4	6.2	
QD-105-RD	10.5	6.2	
QD-106-RD	10.6	6.2	
QD-107-RD	10.7	6.2	
QD-108-RD	10.8	6.2	
QD-109-RD	10.9	6.2	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-110-RD	11.0	6.6	QD110/119-16-..D-..
QD-111-RD	11.1	6.6	
QD-112-RD	11.2	6.6	
QD-113-RD	11.3	6.6	
QD-114-RD	11.4	6.6	
QD-115-RD	11.5	6.6	
QD-116-RD	11.6	6.6	
QD-117-RD	11.7	6.6	
QD-118-RD	11.8	6.6	
QD-119-RD	11.9	6.6	
QD-120-RD	12.0	7.0	QD120/129-16-..D-..
QD-121-RD	12.1	7.0	
QD-122-RD	12.2	7.0	
QD-123-RD	12.3	7.0	
QD-124-RD	12.4	7.0	
QD-125-RD	12.5	7.0	
QD-126-RD	12.6	7.0	
QD-127-RD	12.7	7.0	
QD-128-RD	12.8	7.0	
QD-129-RD	12.9	7.0	
QD-130-RD	13.0	7.6	QD130/139-16-..D-..
QD-131-RD	13.1	7.6	
QD-132-RD	13.2	7.6	
QD-133-RD	13.3	7.6	
QD-134-RD	13.4	7.6	
QD-135-RD	13.5	7.6	
QD-136-RD	13.6	7.6	
QD-137-RD	13.7	7.6	
QD-138-RD	13.8	7.6	
QD-139-RD	13.9	7.6	

RD Cuting head can drill with self-centering and less drill force , it can be used for stainless steel ,titanium , nickelbase alloys, Mn steel etc. and other materials not to be broken easily .

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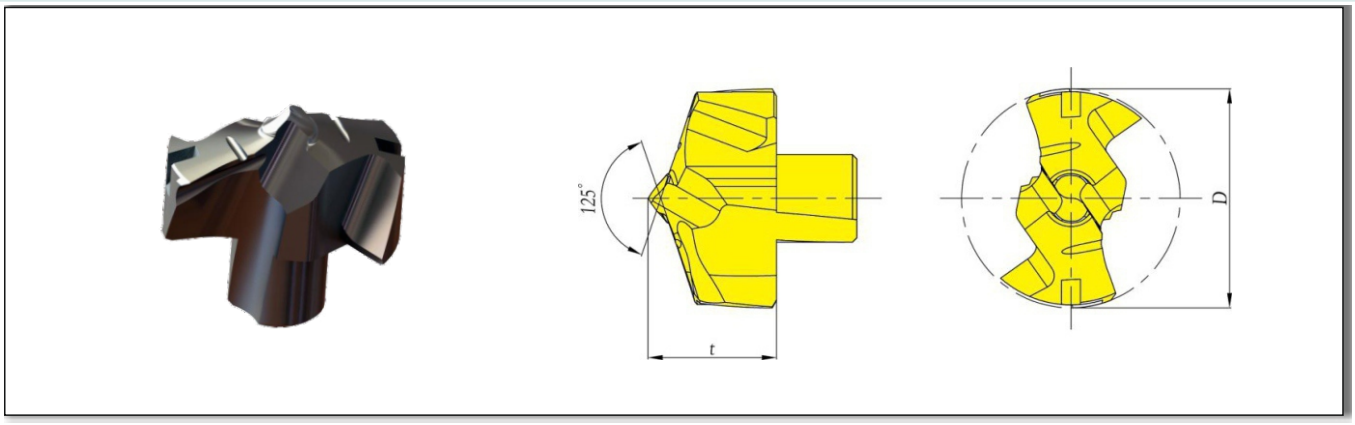
Special Drilling Head RD

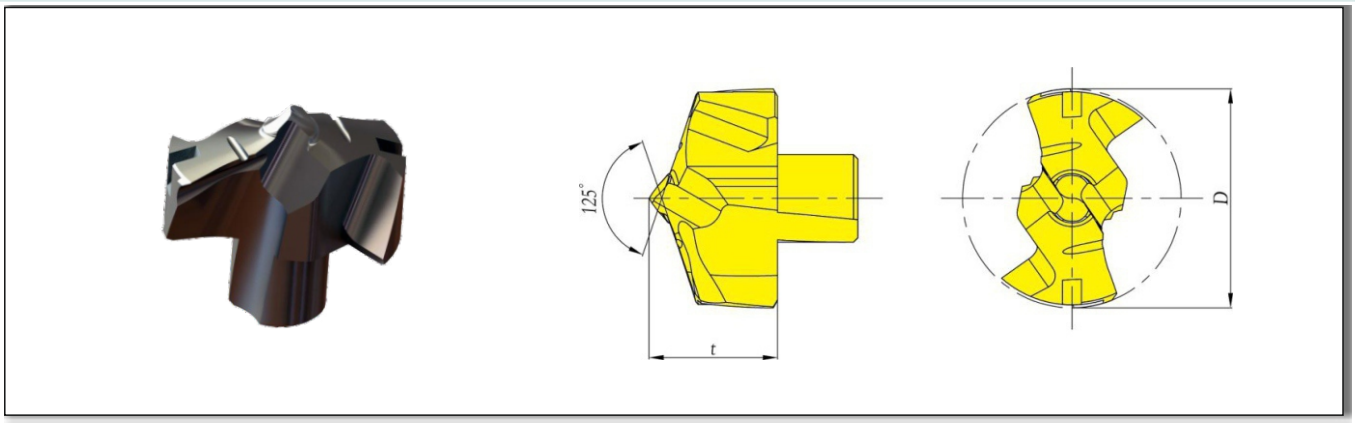


Order No.	Dimensions(mm)		tool holders
	D	t	
QD-140-RD	14.0	8.1	QD140/149-16-..D-..
QD-141-RD	14.1	8.1	
QD-142-RD	14.2	8.1	
QD-143-RD	14.3	8.1	
QD-144-RD	14.4	8.1	
QD-145-RD	14.5	8.1	
QD-146-RD	14.6	8.1	
QD-147-RD	14.7	8.1	
QD-148-RD	14.8	8.1	
QD-149-RD	14.9	8.1	
QD-150-RD	15.0	8.7	QD150/159-20-..D-..
QD-151-RD	15.1	8.7	
QD-152-RD	15.2	8.7	
QD-153-RD	15.3	8.7	
QD-154-RD	15.4	8.7	
QD-155-RD	15.5	8.7	
QD-156-RD	15.6	8.7	
QD-157-RD	15.7	8.7	
QD-158-RD	15.8	8.7	
QD-159-RD	15.9	8.7	
QD-160-RD	16.0	9.3	QD160169-20-..D-..
QD-161-RD	16.1	9.3	
QD-162-RD	16.2	9.3	
QD-163-RD	16.3	9.3	
QD-164-RD	16.4	9.3	
QD-165-RD	16.5	9.3	
QD-166-RD	16.6	9.3	
QD-167-RD	16.7	9.3	
QD-168-RD	16.8	9.3	
QD-169-RD	16.9	9.3	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-170-RD	17.0	9.9	QD170/179-20-..D-..
QD-171-RD	17.1	9.9	
QD-172-RD	17.2	9.9	
QD-173-RD	17.3	9.9	
QD-174-RD	17.4	9.9	
QD-175-RD	17.5	9.9	
QD-176-RD	17.6	9.9	
QD-177-RD	17.7	9.9	
QD-178-RD	17.8	9.9	
QD-179-RD	17.9	9.9	
QD-180-RD	18.0	10.5	QD180/189-25-..D-..
QD-181-RD	18.1	10.5	
QD-182-RD	18.2	10.5	
QD-183-RD	18.3	10.5	
QD-184-RD	18.4	10.5	
QD-185-RD	18.5	10.5	
QD-186-RD	18.6	10.5	
QD-187-RD	18.7	10.5	
QD-188-RD	18.8	10.5	
QD-189-RD	18.9	10.5	
QD-190-RD	19.0	11.0	QD190/199-25-..D-..
QD-191-RD	19.1	11.0	
QD-192-RD	19.2	11.0	
QD-193-RD	19.3	11.0	
QD-194-RD	19.4	11.0	
QD-195-RD	19.5	11.0	
QD-196-RD	19.6	11.0	
QD-197-RD	19.7	11.0	
QD-198-RD	19.8	11.0	
QD-199-RD	19.9	11.0	

RD Cuting head can drill with self-centering and less drill force , it can be used for stainless steel ,titanium , nickelbase alloys, Mn steel etc. and other materials not to be broken easily .

Special Drilling Head RD



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-200-RD	20.0	11.6	QD200/209-25-..D-..
QD-201-RD	20.1	11.6	
QD-202-RD	20.2	11.6	
QD-203-RD	20.3	11.6	
QD-204-RD	20.4	11.6	
QD-205-RD	20.5	11.6	
QD-206-RD	20.6	11.6	
QD-207-RD	20.7	11.6	
QD-208-RD	20.8	11.6	
QD-209-RD	20.9	11.6	
QD-210-RD	21.0	12.1	QD210/219-25-..D-..
QD-211-RD	21.1	12.1	
QD-212-RD	21.2	12.1	
QD-213-RD	21.3	12.1	
QD-214-RD	21.4	12.1	
QD-215-RD	21.5	12.1	
QD-216-RD	21.6	12.1	
QD-217-RD	21.7	12.1	
QD-218-RD	21.8	12.1	
QD-219-RD	21.9	12.1	
QD-220-RD	22.0	12.7	QD220/229-25-..D-..
QD-221-RD	22.1	12.7	
QD-222-RD	22.2	12.7	
QD-223-RD	22.3	12.7	
QD-224-RD	22.4	12.7	
QD-225-RD	22.5	12.7	
QD-226-RD	22.6	12.7	
QD-227-RD	22.7	12.7	
QD-228-RD	22.8	12.7	
QD-229-RD	22.9	12.7	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-230-RD	23.0	13.3	QD230/239-32-..D-..
QD-231-RD	23.1	13.3	
QD-232-RD	23.2	13.3	
QD-233-RD	23.3	13.3	
QD-234-RD	23.4	13.3	
QD-235-RD	23.5	13.3	
QD-236-RD	23.6	13.3	
QD-237-RD	23.7	13.3	
QD-238-RD	23.8	13.3	
QD-239-RD	23.9	13.3	
QD-240-RD	24.0	13.9	QD240/249-32-..D-..
QD-241-RD	24.1	13.9	
QD-242-RD	24.2	13.9	
QD-243-RD	24.3	13.9	
QD-244-RD	24.4	13.9	
QD-245-RD	24.5	13.9	
QD-246-RD	24.6	13.9	
QD-247-RD	24.7	13.9	
QD-248-RD	24.8	13.9	
QD-249-RD	24.9	13.9	
QD-250-RD	25.0	14.5	QD250/260-32-..D-..
QD-251-RD	25.1	14.5	
QD-252-RD	25.2	14.5	
QD-253-RD	25.3	14.5	
QD-254-RD	25.4	14.5	
QD-255-RD	25.5	14.5	
QD-256-RD	25.6	14.5	
QD-257-RD	25.7	14.5	
QD-258-RD	25.8	14.5	
QD-259-RD	25.9	14.5	
QD-260-RD	26.0	14.5	

RD Cuting head can drill with self-centering and less drill force , it can be used for stainless steel ,titanium , nickelbase alloys, Mn steel etc. and other materials not to be broken easily .

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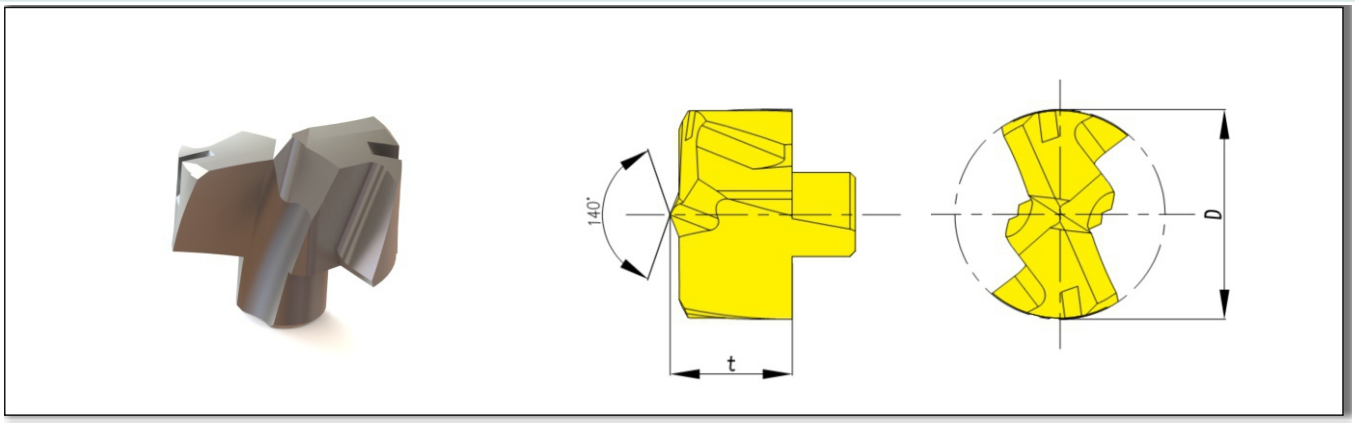
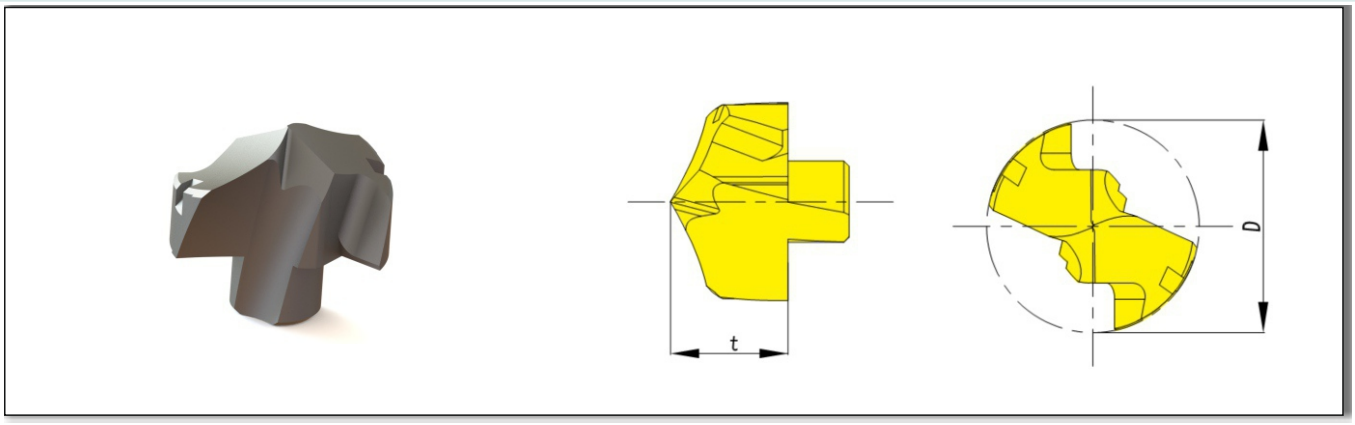
Flat Cutting Drilling Head



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-080-F	8.0	4.0	QD080-089-12-..D-..
QD-085-F	8.5	4.0	
QD-090-F	9.0	4.2	QD090-099-12-..D-..
QD-095-F	9.5	4.2	
QD-100-F	10.0	4.4	QD100-109-16-..D-..
QD-105-F	10.5	4.4	
QD-110-F	11.0	4.5	QD110-119-16-..D-..
QD-115-F	11.5	4.5	
QD-120-F	12.0	4.8	QD120-129-16-..D-..
QD-125-F	12.5	4.8	
QD-130-F	13.0	5.1	QD130-139-16-..D-..
QD-135-F	13.5	5.1	
QD-140-F	14.0	5.5	QD140-149-16-..D-..
QD-145-F	14.5	5.5	
QD-150-F	15.0	5.9	QD150-159-20-..D-..
QD-155-F	15.5	5.9	
QD-160-F	16.0	6.3	QD160-169-20-..D-..
QD-165-F	16.5	6.3	
QD-170-F	17.0	6.6	QD170-179-20-..D-..
QD-175-F	17.5	6.6	
QD-180-F	18.0	6.9	QD180-189-25-..D-..
QD-185-F	18.5	6.9	
QD-190-F	19.0	7.2	QD190-199-25-..D-..
QD-195-F	19.5	7.2	
QD-200-F	20.0	8.2	QD200-209-25-..D-..
QD-205-F	20.5	8.2	
QD-210-F	21.0	8.6	QD210-219-25-..D-..
QD-215-F	21.5	8.6	
QD-220-F	22.0	8.9	QD220-229-25-..D-..
QD-225-F	22.5	8.9	
QD-230-F	23.0	9.3	QD230-239-32-..D-..
QD-235-F	23.5	9.3	
QD-240-F	24.0	9.7	QD240-249-32-..D-..
QD-245-F	24.5	9.7	
QD-250-F	25.0	10.1	QD250-260-32-..D-..
QD-255-F	25.5	10.1	
QD-260-F	26.0	10.1	

F flat cutting head can be used for drilling blind flat holes of common material holes ,but isn't recommended in drilling difficult-to-machine materials

Centering Cutting Drilling Head



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-080-C	8.0	5.4	QD080-089-12-..D-..
QD-085-C	8.5	5.4	
QD-090-C	9.0	5.8	QD090-099-12-..D-..
QD-095-C	9.5	5.8	
QD-100-C	10.0	6.2	QD100-109-16-..D-..
QD-105-C	10.5	6.2	
QD-110-C	11.0	6.6	QD110-119-16-..D-..
QD-115-C	11.5	6.6	
QD-120-C	12.0	7.0	QD120-129-16-..D-..
QD-125-C	12.5	7.0	
QD-130-C	13.0	7.6	QD130-139-16-..D-..
QD-135-C	13.5	7.6	
QD-140-C	14.0	8.2	QD140-149-16-..D-..
QD-145-C	14.5	8.2	
QD-150-C	15.0	8.7	QD150-159-20-..D-..
QD-155-C	15.5	8.7	
QD-160-C	16.0	9.3	QD160-169-20-..D-..
QD-165-C	16.5	9.3	
QD-170-C	17.0	9.9	QD170-179-20-..D-..
QD-175-C	17.5	9.9	
QD-180-C	18.0	10.5	QD180-189-25-..D-..
QD-185-C	18.5	10.5	
QD-190-C	19.0	11.0	QD190-199-25-..D-..
QD-195-C	19.5	11.0	
QD-200-C	20.0	11.6	QD200-209-25-..D-..
QD-205-C	20.5	11.6	
QD-210-C	21.0	12.2	QD210-219-25-..D-..
QD-215-C	21.5	12.2	
QD-220-C	22.0	12.8	QD220-229-25-..D-..
QD-225-C	22.5	12.8	
QD-230-C	23.0	13.3	QD230-239-32-..D-..
QD-235-C	23.5	13.3	
QD-240-C	24.0	13.9	QD240-249-32-..D-..
QD-245-C	24.5	13.9	
QD-250-C	25.0	14.5	QD250-260-32-..D-..
QD-255-C	25.5	14.5	
QD-260-C	26.0	14.5	

C self- centering cutting head can be used with excellent centering performance in drilling common metal materials , but isn't recommended for drilling difficult-to-machine materials

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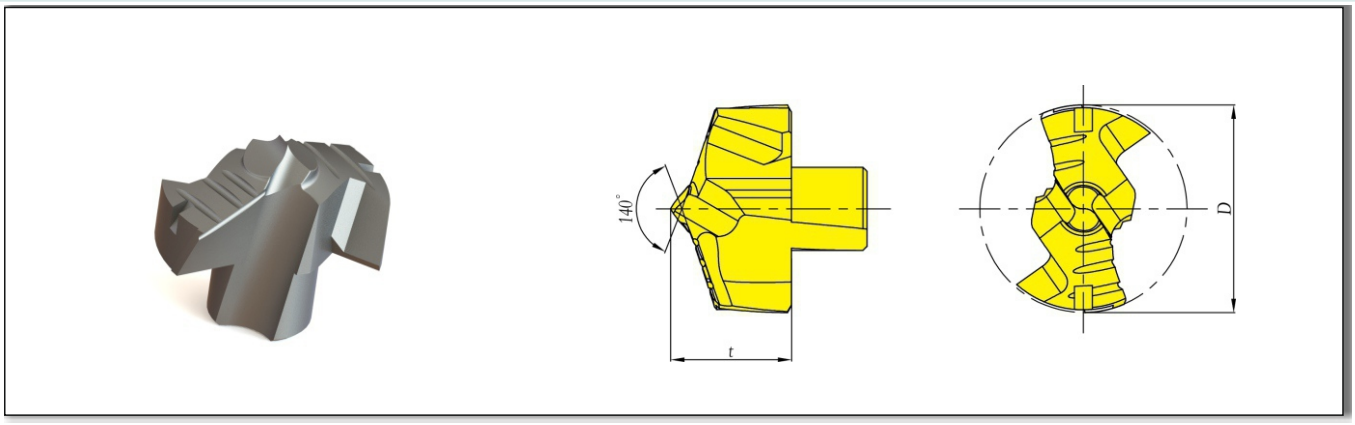
Special Drilling Head RB

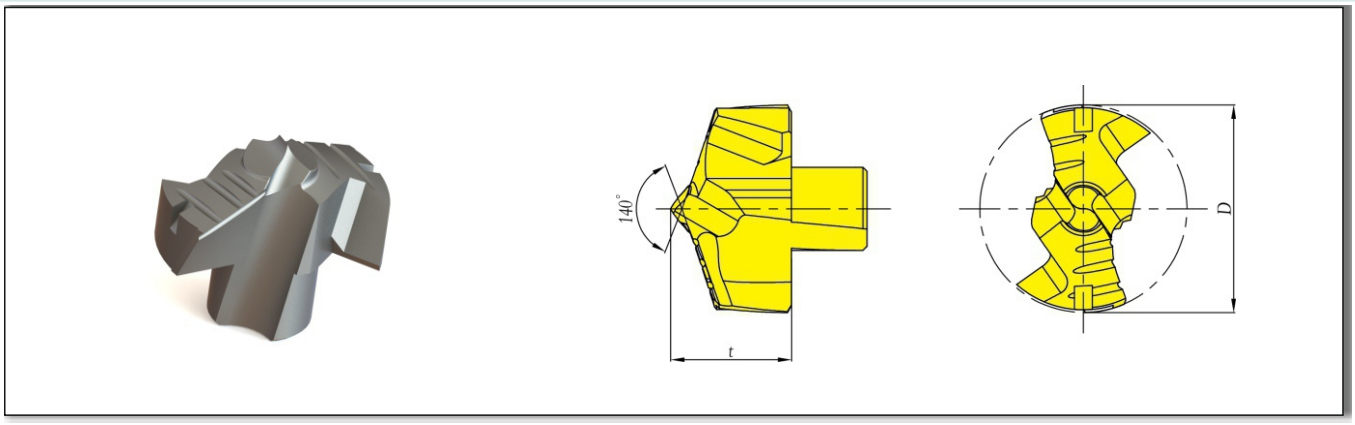


Order No.	Dimensions(mm)		tool holders
	D	t	
QD-080-RB	8.0	5.4	QD080/089-12-..D-..
QD-081-RB	8.1	5.4	
QD-082-RB	8.2	5.4	
QD-083-RB	8.3	5.4	
QD-084-RB	8.4	5.4	
QD-085-RB	8.5	5.4	
QD-086-RB	8.6	5.4	
QD-087-RB	8.7	5.4	
QD-088-RB	8.8	5.4	
QD-089-RB	8.9	5.4	
QD-090-RB	9.0	5.8	QD090/099-12-..D-..
QD-091-RB	9.1	5.8	
QD-092-RB	9.2	5.8	
QD-093-RB	9.3	5.8	
QD-094-RB	9.4	5.8	
QD-095-RB	9.5	5.8	
QD-096-RB	9.6	5.8	
QD-097-RB	9.7	5.8	
QD-098-RB	9.8	5.8	
QD-099-RB	9.9	5.8	
QD-100-RB	10.0	6.2	QD100/109-16-..D-..
QD-101-RB	10.1	6.2	
QD-102-RB	10.2	6.2	
QD-103-RB	10.3	6.2	
QD-104-RB	10.4	6.2	
QD-105-RB	10.5	6.2	
QD-106-RB	10.6	6.2	
QD-107-RB	10.7	6.2	
QD-108-RB	10.8	6.2	
QD-109-RB	10.9	6.2	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-110-RB	11.0	6.6	QD110/119-16-..D-..
QD-111-RB	11.1	6.6	
QD-112-RB	11.2	6.6	
QD-113-RB	11.3	6.6	
QD-114-RB	11.4	6.6	
QD-115-RB	11.5	6.6	
QD-116-RB	11.6	6.6	
QD-117-RB	11.7	6.6	
QD-118-RB	11.8	6.6	
QD-119-RB	11.9	6.6	
QD-120-RB	12.0	7.0	QD120/129-16-..D-..
QD-121-RB	12.1	7.0	
QD-122-RB	12.2	7.0	
QD-123-RB	12.3	7.0	
QD-124-RB	12.4	7.0	
QD-125-RB	12.5	7.0	
QD-126-RB	12.6	7.0	
QD-127-RB	12.7	7.0	
QD-128-RB	12.8	7.0	
QD-129-RB	12.9	7.0	
QD-130-RB	13.0	7.6	QD130/139-16-..D-..
QD-131-RB	13.1	7.6	
QD-132-RB	13.2	7.6	
QD-133-RB	13.3	7.6	
QD-134-RB	13.4	7.6	
QD-135-RB	13.5	7.6	
QD-136-RB	13.6	7.6	
QD-137-RB	13.7	7.6	
QD-138-RB	13.8	7.6	
QD-139-RB	13.9	7.6	

RB Cuting head can drill with self-centering and less drill force , it can be used for stainless steel ,titanium , nickelbase alloys, Mn steel etc. and other materials not to be broken easily .

Special Drilling Head RB



Order No.	Dimensions(mm)		tool holders
	D	t	
QD-140-RB	14.0	8.1	QD140/149-16-..D-..
QD-141-RB	14.1	8.1	
QD-142-RB	14.2	8.1	
QD-143-RB	14.3	8.1	
QD-144-RB	14.4	8.1	
QD-145-RB	14.5	8.1	
QD-146-RB	14.6	8.1	
QD-147-RB	14.7	8.1	
QD-148-RB	14.8	8.1	
QD-149-RB	14.9	8.1	
QD-150-RB	15.0	8.7	QD150/159-20-..D-..
QD-151-RB	15.1	8.7	
QD-152-RB	15.2	8.7	
QD-153-RB	15.3	8.7	
QD-154-RB	15.4	8.7	
QD-155-RB	15.5	8.7	
QD-156-RB	15.6	8.7	
QD-157-RB	15.7	8.7	
QD-158-RB	15.8	8.7	
QD-159-RB	15.9	8.7	
QD-160-RB	16.0	9.3	QD160169-20-..D-..
QD-161-RB	16.1	9.3	
QD-162-RB	16.2	9.3	
QD-163-RB	16.3	9.3	
QD-164-RB	16.4	9.3	
QD-165-RB	16.5	9.3	
QD-166-RB	16.6	9.3	
QD-167-RB	16.7	9.3	
QD-168-RB	16.8	9.3	
QD-169-RB	16.9	9.3	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-170-RB	17.0	9.9	QD170/179-20-..D-..
QD-171-RB	17.1	9.9	
QD-172-RB	17.2	9.9	
QD-173-RB	17.3	9.9	
QD-174-RB	17.4	9.9	
QD-175-RB	17.5	9.9	
QD-176-RB	17.6	9.9	
QD-177-RB	17.7	9.9	
QD-178-RB	17.8	9.9	
QD-179-RB	17.9	9.9	
QD-180-RB	18.0	10.5	QD180/189-25-..D-..
QD-181-RB	18.1	10.5	
QD-182-RB	18.2	10.5	
QD-183-RB	18.3	10.5	
QD-184-RB	18.4	10.5	
QD-185-RB	18.5	10.5	
QD-186-RB	18.6	10.5	
QD-187-RB	18.7	10.5	
QD-188-RB	18.8	10.5	
QD-189-RB	18.9	10.5	
QD-190-RB	19.0	11.0	QD190/199-25-..D-..
QD-191-RB	19.1	11.0	
QD-192-RB	19.2	11.0	
QD-193-RB	19.3	11.0	
QD-194-RB	19.4	11.0	
QD-195-RB	19.5	11.0	
QD-196-RB	19.6	11.0	
QD-197-RB	19.7	11.0	
QD-198-RB	19.8	11.0	
QD-199-RB	19.9	11.0	

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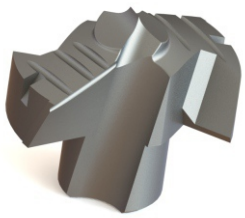
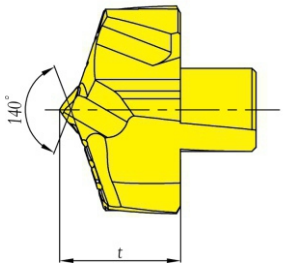
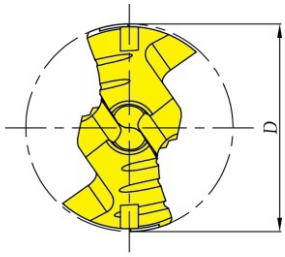
Special Drilling Head RB







Order No.	Dimensions(mm)		tool holders
	D	t	
QD-200-RB	20.0	11.6	QD200/209-25-..D-..
QD-201-RB	20.1	11.6	
QD-202-RB	20.2	11.6	
QD-203-RB	20.3	11.6	
QD-204-RB	20.4	11.6	
QD-205-RB	20.5	11.6	
QD-206-RB	20.6	11.6	
QD-207-RB	20.7	11.6	
QD-208-RB	20.8	11.6	
QD-209-RB	20.9	11.6	
QD-210-RB	21.0	12.1	QD210/219-25-..D-..
QD-211-RB	21.1	12.1	
QD-212-RB	21.2	12.1	
QD-213-RB	21.3	12.1	
QD-214-RB	21.4	12.1	
QD-215-RB	21.5	12.1	
QD-216-RB	21.6	12.1	
QD-217-RB	21.7	12.1	
QD-218-RB	21.8	12.1	
QD-219-RB	21.9	12.1	
QD-220-RB	22.0	12.7	QD220/229-25-..D-..
QD-221-RB	22.1	12.7	
QD-222-RB	22.2	12.7	
QD-223-RB	22.3	12.7	
QD-224-RB	22.4	12.7	
QD-225-RB	22.5	12.7	
QD-226-RB	22.6	12.7	
QD-227-RB	22.7	12.7	
QD-228-RB	22.8	12.7	
QD-229-RB	22.9	12.7	

Order No.	Dimensions(mm)		tool holders
	D	t	
QD-230-RB	23.0	13.3	QD230/239-32-..D-..
QD-231-RB	23.1	13.3	
QD-232-RB	23.2	13.3	
QD-233-RB	23.3	13.3	
QD-234-RB	23.4	13.3	
QD-235-RB	23.5	13.3	
QD-236-RB	23.6	13.3	
QD-237-RB	23.7	13.3	
QD-238-RB	23.8	13.3	
QD-239-RB	23.9	13.3	
QD-240-RB	24.0	13.9	QD240/249-32-..D-..
QD-241-RB	24.1	13.9	
QD-242-RB	24.2	13.9	
QD-243-RB	24.3	13.9	
QD-244-RB	24.4	13.9	
QD-245-RB	24.5	13.9	
QD-246-RB	24.6	13.9	
QD-247-RB	24.7	13.9	
QD-248-RB	24.8	13.9	
QD-249-RB	24.9	13.9	
QD-250-RB	25.0	14.5	QD250/260-32-..D-..
QD-251-RB	25.1	14.5	
QD-252-RB	25.2	14.5	
QD-253-RB	25.3	14.5	
QD-254-RB	25.4	14.5	
QD-255-RB	25.5	14.5	
QD-256-RB	25.6	14.5	
QD-257-RB	25.7	14.5	
QD-258-RB	25.8	14.5	
QD-259-RB	25.9	14.5	
QD-260-RB	26.0	14.5	

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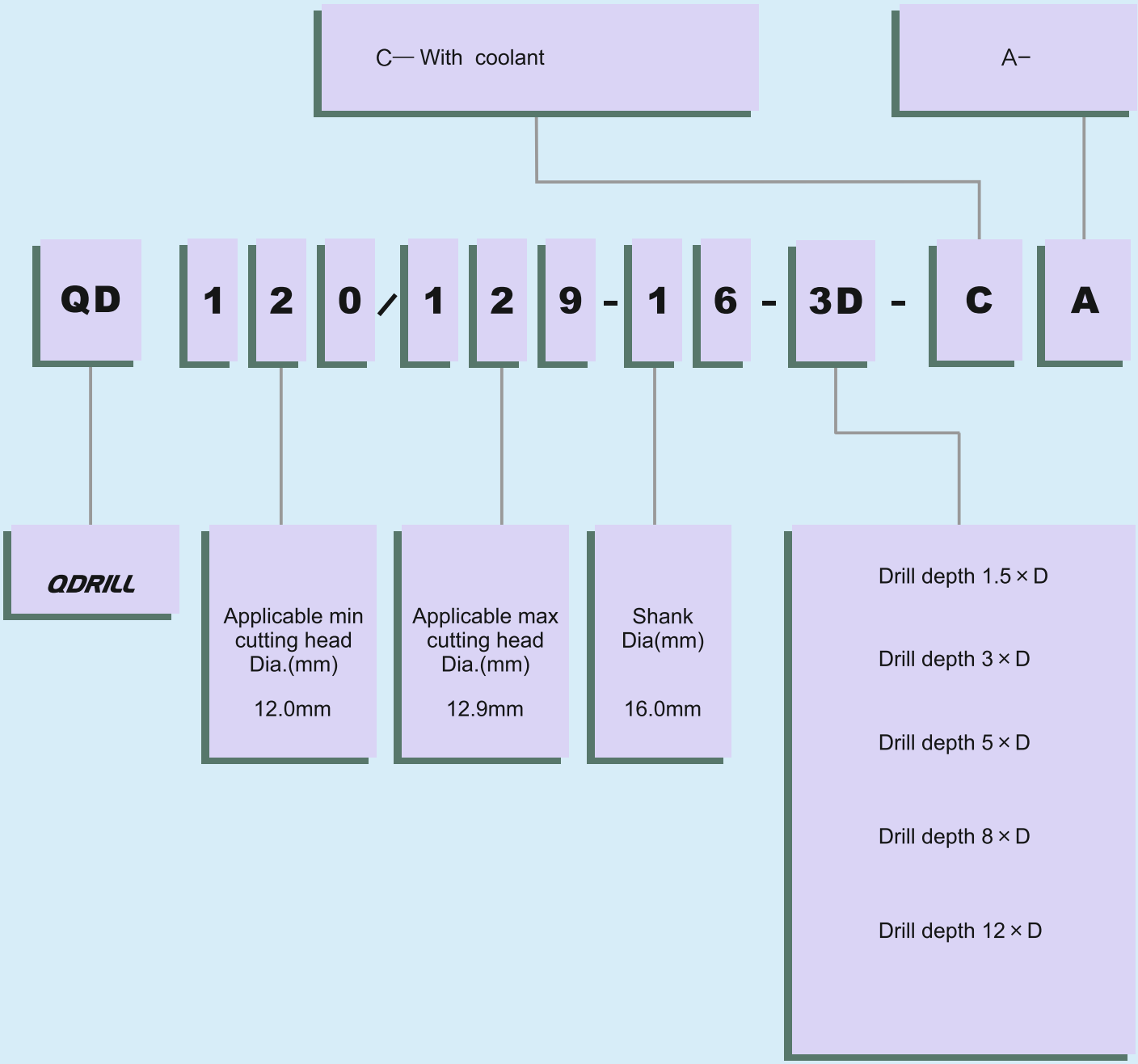
Mono Tip Line Toolholder Orddering Code System



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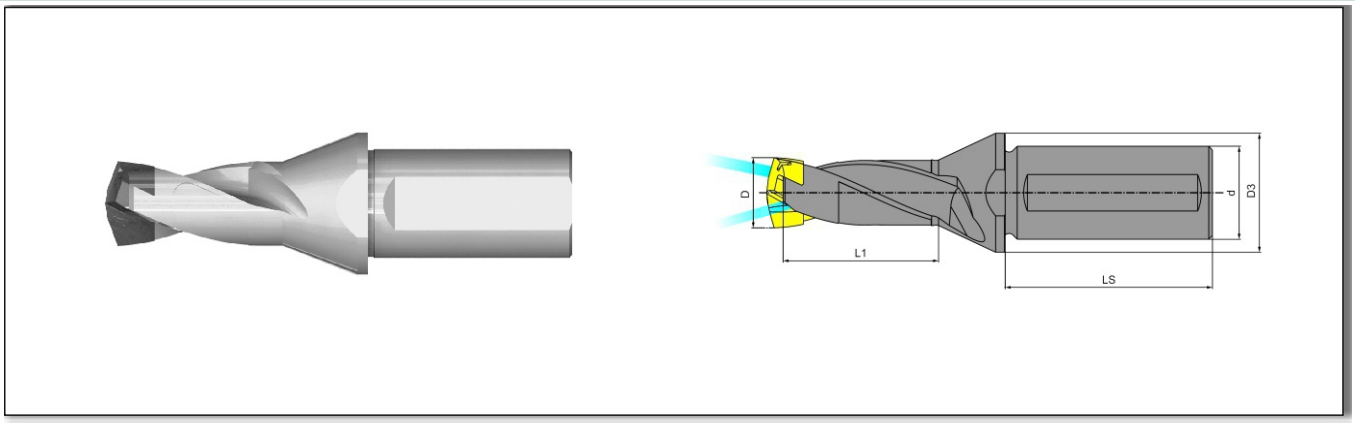
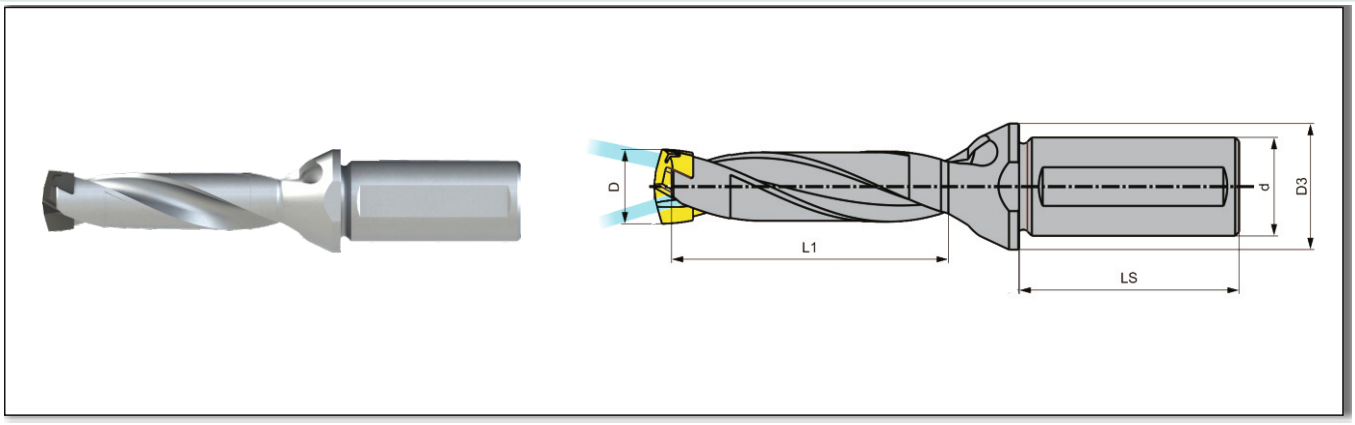
Mono Tip Line Toolholders



Order No.	Applicable cutting head Dia.(mm)	Dimensions(mm)					Wrench
		d	D3	L1	Ls	D	
QD080/089-12-1.5D-CA	8.0~8.9	12	16	16	45	7.8	8-11.9
QD090/099-12-1.5D-CA	9.0~9.9	12	16	18	45	8.8	
QD100/109-16-1.5D-CA	10.0~10.9	16	20	20	48	9.8	
QD110/119-16-1.5D-CA	11.0~11.9	16	20	22	48	10.8	
QD120/129-16-1.5D-CA	12.0~12.9	16	20	24	48	11.8	12-16.9
QD130/139-16-1.5D-CA	13.0~13.9	16	20	25	48	12.8	
QD140/149-16-1.5D-CA	14.0~14.9	16	20	27	48	13.8	
QD150/159-20-1.5D-CA	15.0~15.9	20	25	29	50	14.8	
QD160/169-20-1.5D-CA	16.0~16.9	20	25	30	50	15.8	
QD170/179-20-1.5D-CA	17.0~17.9	20	25	32	50	16.8	17-20.9
QD180/189-25-1.5D-CA	18.0~18.9	25	32	34	56	17.8	
QD190/199-25-1.5D-CA	19.0~19.9	25	32	36	56	18.8	
QD200/209-25-1.5D-CA	20.0~20.9	25	32	38	56	19.8	
QD210/219-25-1.5D-CA	21.0~21.9	25	32	40	56	20.8	21-26
QD220/229-25-1.5D-CA	22.0~22.9	25	32	42	56	21.8	
QD230/239-32-1.5D-CA	23.0~23.9	32	42	43	60	22.8	
QD240/249-32-1.5D-CA	24.0~24.9	32	42	45	60	23.8	
QD250/260-32-1.5D-CA	25.0~26.0	32	42	47	60	24.8	
inch	**inch**	**inch**	**mm**	**mm**	**mm**	**mm**	
QD5/16-11/32-1/2-1.5D-CA	5/16~11/32	1/2	16	16	45	7.5	8-11.9
QD23/64-25/64-1/2-1.5D-CA	23/64~25/64	1/2	16	18	45	8.8	
QD13/32-27/64-5/8-1.5D-CA	13/32~27/64	5/8	20	20	48	9.9	
QD7/16-15/32-5/8-1.5D-CA	7/16~15/32	5/8	20	22	48	10.7	
QD31/64-1/2-5/8-1.5D-CA	31/64~1/2	5/8	20	24	48	11.9	12-16.9
QD33/64-35/64-1/2-1.5D-CA	33/64~35/64	5/8	20	25	48	12.6	
QD9/16-37/64-1/2-1.5D-CA	9/16~37/64	5/8	25	27	48	13.8	
QD19/32-5/8-3/4-1.5D-CA	19/32~5/8	3/4	25	29	50	14.5	
QD41/64-21/32-3/4-1.5D-CA	41/64~21/32	3/4	25	30	50	15.6	
QD43/64-45/64-3/4-1.5D-CA	43/64~45/64	3/4	25	32	50	16.7	17-20.9
QD23/32-47/64-1-1.5D-CA	23/32~47/64	1	32	34	56	17.6	
QD3/8-25/32-1-1.5D-CA	3/8~25/32	1	32	36	56	18.4	
QD51/64-13/16-1-1.5D-CA	51/64~13/16	1	32	38	56	19.6	
QD53/64-55/64-1-1.5D-CA	53/64~55/64	1	32	40	56	20.4	21-26
QD7/8-57/64-1-1.5D-CA	7/8~57/64	1	32	42	56	21.6	
QD29/32-59/64-1 1/4-1.5D-CA	29/32~59/64	1 1/4	42	43	60	22.4	
QD61/64-31/32-1 1/4-1.5D-CA	61/64~1/32	1 1/4	42	45	60	23.6	
QD63/64-1-1 1/4-1.5D-CA	63/64~1	1 1/4	42	47	60	24.4	

Mono Tip Line Toolholders



Order No.	Applicable cutting head Dia.(mm)	Dimensions(mm)					Wrench
		d	D3	L1	Ls	D	
QD080/089-12-3D-CA	8.0~8.9	12	16	32	45	7.8	8-11.9
QD090/099-12-3D-CA	9.0~9.9	12	16	35	45	8.8	
QD100/109-16-3D-CA	10.0~10.9	16	20	39	48	9.8	
QD110/119-16-3D-CA	11.0~11.9	16	20	42	48	10.8	
QD120/129-16-3D-CA	12.0~12.9	16	20	45	48	11.8	12-16.9
QD130/139-16-3D-CA	13.0~13.9	16	20	49	48	12.8	
QD140/149-16-3D-CA	14.0~14.9	16	20	53	48	13.8	
QD150/159-20-3D-CA	15.0~15.9	20	25	56	50	14.8	
QD160/169-20-3D-CA	16.0~16.9	20	25	60	50	15.8	
QD170/179-20-3D-CA	17.0~17.9	20	25	63	50	16.8	17-20.9
QD180/189-25-3D-CA	18.0~18.9	25	32	66	56	17.8	
QD190/199-25-3D-CA	19.0~19.9	25	32	70	56	18.8	
QD200/209-25-3D-CA	20.0~20.9	25	32	73	56	19.8	
QD210/219-25-3D-CA	21.0~21.9	25	32	77	56	20.8	21-26
QD220/229-25-3D-CA	22.0~22.9	25	32	80	56	21.8	
QD230/239-32-3D-CA	23.0~23.9	32	42	84	60	22.8	
QD240/249-32-3D-CA	24.0~24.9	32	42	88	60	23.8	
QD250/260-32-3D-CA	25.0~26.0	32	42	91	60	24.8	
inch	**inch**	**inch**	**mm**	**mm**	**mm**	**mm**	
QD5/16-11/32-1/2-3D-CA	5/16~11/32	1/2	16	32	45	7.5	8-11.9
QD23/64-25/64-1/2-3D-CA	23/64~25/64	1/2	16	35	45	8.8	
QD13/32-27/64-5/8-3D-CA	13/32~27/64	5/8	20	39	48	9.9	
QD7/16-15/32-5/8-3D-CA	7/16~15/32	5/8	20	42	48	10.7	
QD31/64-1/2-5/8-3D-CA	31/64~1/2	5/8	20	45	48	11.9	12-16.9
QD33/64-35/64-1/2-3D-CA	33/64~35/64	5/8	20	49	48	12.6	
QD9/16-37/64-1/2-3D-CA	9/16~37/64	5/8	25	53	48	13.8	
QD19/32-5/8-3/4-3D-CA	19/32~5/8	3/4	25	56	50	14.5	
QD41/64-21/32-3/4-3D-CA	41/64~21/32	3/4	25	60	50	15.6	
QD43/64-45/64-3/4-3D-CA	43/64~45/64	3/4	25	63	50	16.7	17-20.9
QD23/32-47/64-1-3D-CA	23/32~47/64	1	32	66	56	17.6	
QD3/8-25/32-1-3D-CA	3/8~25/32	1	32	70	56	18.4	
QD51/64-13/16-1-3D-CA	51/64~13/16	1	32	73	56	19.6	
QD53/64-55/64-1-3D-CA	53/64~55/64	1	32	77	56	20.4	21-26
QD7/8-57/64-1-3D-CA	7/8~57/64	1	32	80	56	21.6	
QD29/32-59/64-1 1/4-3D-CA	29/32~59/64	1 1/4	42	84	60	22.4	
QD61/64-31/32-1 1/4-3D-CA	61/64~1/32	1 1/4	42	88	60	23.6	
QD63/64-1-1 1/4-3D-CA	63/64~1	1 1/4	42	91	60	24.4	

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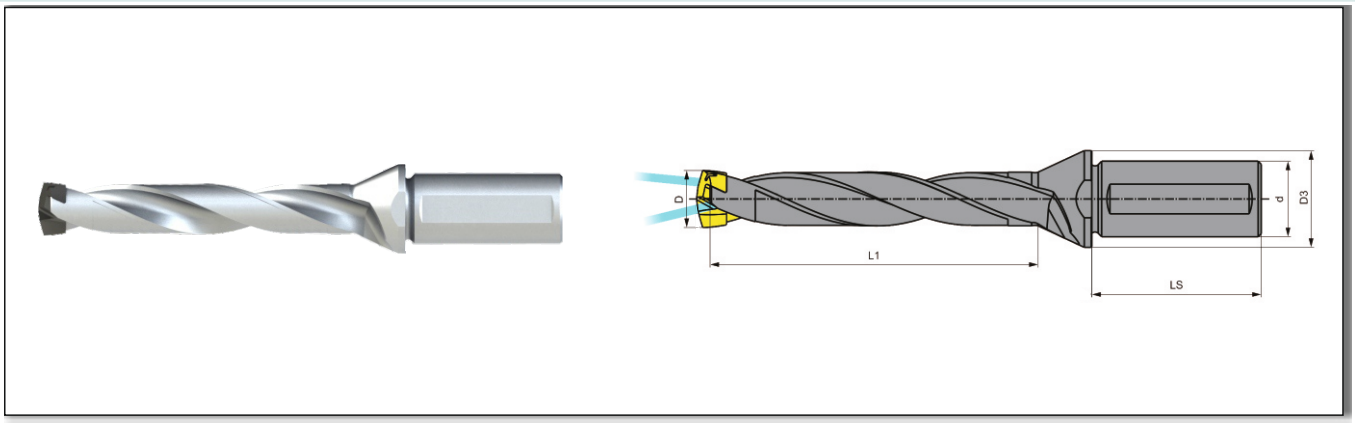
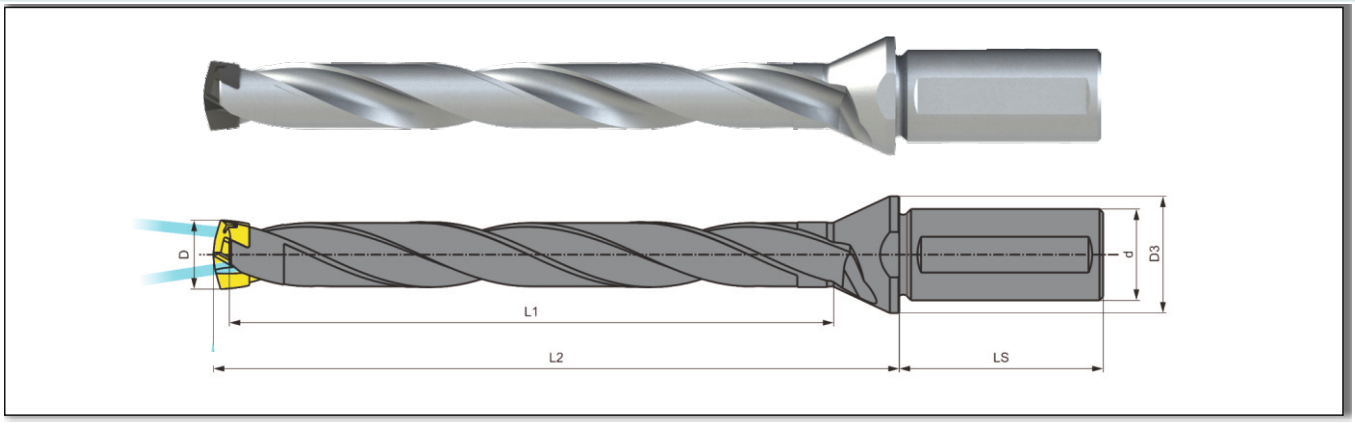
Mono Tip Line Toolholders



Order No.	Applicable cutting head Dia.(mm)	Dimensions(mm)					Wrench
		d	D3	L1	Ls	D	
QD080/089-12-5D-CA	8.0~8.9	12	16	50	45	7.8	8-11.9
QD090/099-12-5D-CA	9.0~9.9	12	16	55	45	8.8	
QD100/109-16-5D-CA	10.0~10.9	16	20	60	48	9.8	
QD110/119-16-5D-CA	11.0~11.9	16	20	66	48	10.8	
QD120/129-16-5D-CA	12.0~12.9	16	20	71	48	11.8	12-16.9
QD130/139-16-5D-CA	13.0~13.9	16	20	77	48	12.8	
QD140/149-16-5D-CA	14.0~14.9	16	20	82	48	13.8	
QD150/159-20-5D-CA	15.0~15.9	20	25	88	50	14.8	
QD160/169-20-5D-CA	16.0~16.9	20	25	93	50	15.8	
QD170/179-20-5D-CA	17.0~17.9	20	25	99	50	16.8	17-20.9
QD180/189-25-5D-CA	18.0~18.9	25	32	104	56	17.8	
QD190/199-25-5D-CA	19.0~19.9	25	32	110	56	18.8	
QD200/209-25-5D-CA	20.0~20.9	25	32	115	56	19.8	
QD210/219-25-5D-CA	21.0~21.9	25	32	121	56	20.8	21-26
QD220/229-25-5D-CA	22.0~22.9	25	32	126	56	21.8	
QD230/239-32-5D-CA	23.0~23.9	32	42	132	60	22.8	
QD240/249-32-5D-CA	24.0~24.9	32	42	137	60	23.8	
QD250/260-32-5D-CA	25.0~26.0	32	42	143	60	24.8	
inch	**inch**	**inch**	**mm**	**mm**	**mm**	**mm**	
QD5/16-11/32-1/2-5D-CA	5/16~11/32	1/2	16	50	45	7.5	8-11.9
QD23/64-25/64-1/2-5D-CA	23/64~25/64	1/2	16	55	45	8.8	
QD13/32-27/64-5/8-5D-CA	13/32~27/64	5/8	20	60	48	9.9	
QD7/16-15/32-5/8-5D-CA	7/16~15/32	5/8	20	66	48	10.7	
QD31/64-1/2-5/8-5D-CA	31/64~1/2	5/8	20	71	48	11.9	12-16.9
QD33/64-35/64-1/2-5D-CA	33/64~35/64	5/8	20	77	48	12.6	
QD9/16-37/64-1/2-5D-CA	9/16~37/64	5/8	25	82	48	13.8	
QD19/32-5/8-3/4-5D-CA	19/32~5/8	3/4	25	88	50	14.5	
QD41/64-21/32-3/4-5D-CA	41/64~21/32	3/4	25	93	50	15.6	
QD43/64-45/64-3/4-5D-CA	43/64~45/64	3/4	25	99	50	16.7	17-20.9
QD23/32-47/64-1-5D-CA	23/32~47/64	1	32	104	56	17.6	
QD3/8-25/32-1-5D-CA	3/8~25/32	1	32	110	56	18.4	
QD51/64-13/16-1-5D-CA	51/64~13/16	1	32	115	56	19.6	
QD53/64-55/64-1-5D-CA	53/64~55/64	1	32	121	56	20.4	21-26
QD7/8-57/64-1-5D-CA	7/8~57/64	1	32	126	56	21.6	
QD29/32-59/64-1 1/4-5D-CA	29/32~59/64	1 1/4	42	132	60	22.4	
QD61/64-31/32-1 1/4-5D-CA	61/64~1/32	1 1/4	42	137	60	23.6	
QD63/64-1-1 1/4-5D-CA	63/64~1	1 1/4	42	143	60	24.4	

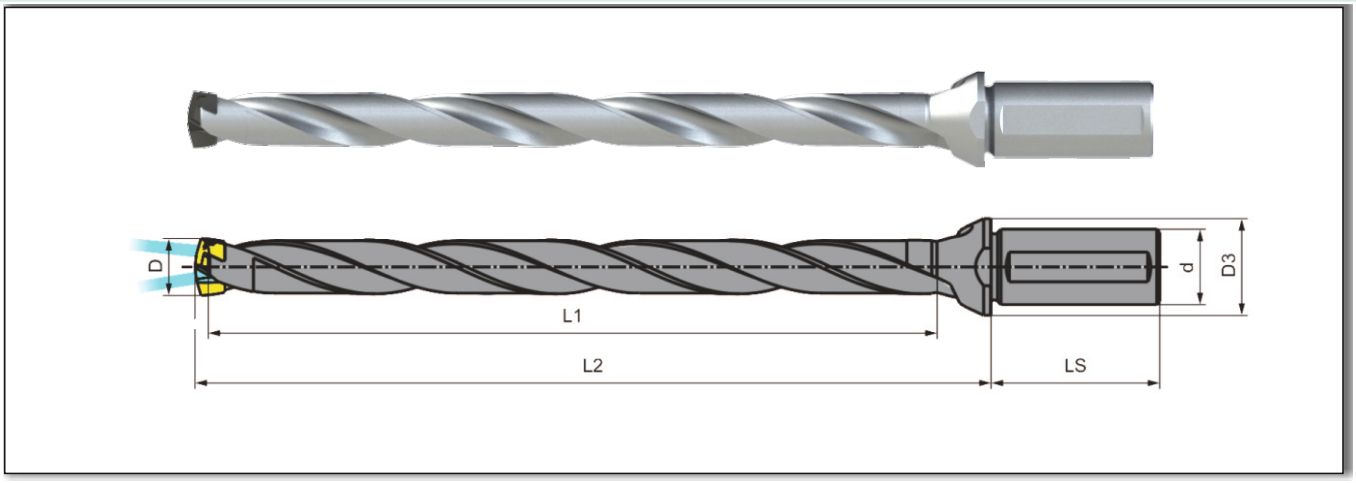
Mono Tip Line Toolholders



Order No.	Applicable cutting head Dia.(mm)	Dimensions(mm)					Wrench
		d	D3	L1	Ls	D	
QD080/089-12-8D-CA	8.0~8.9	12	16	76	45	7.6	8-11.9
QD090/099-12-8D-CA	9.0~9.9	12	16	85	45	8.6	
QD100/109-16-8D-CA	10.0~10.9	16	20	93	48	9.6	
QD110/119-16-8D-CA	11.0~11.9	16	20	102	48	10.6	
QD120/129-16-8D-CA	12.0~12.9	16	20	110	48	11.6	12-16.9
QD130/139-16-8D-CA	13.0~13.9	16	20	119	48	12.6	
QD140/149-16-8D-CA	14.0~14.9	16	20	127	48	13.6	
QD150/159-20-8D-CA	15.0~15.9	20	25	136	50	14.6	
QD160/169-20-8D-CA	16.0~16.9	20	25	144	50	15.6	
QD170/179-20-8D-CA	17.0~17.9	20	25	153	50	16.6	17-20.9
QD180/189-25-8D-CA	18.0~18.9	25	32	161	56	17.6	
QD190/199-25-8D-CA	19.0~19.9	25	32	170	56	18.6	
QD200/209-25-8D-CA	20.0~20.9	25	32	178	56	19.6	
QD210/219-25-8D-CA	21.0~21.9	25	32	187	56	20.6	21-26
QD220/229-25-8D-CA	22.0~22.9	25	32	195	56	21.6	
QD230/239-32-8D-CA	23.0~23.9	32	42	204	60	22.6	
QD240/249-32-8D-CA	24.0~24.9	32	42	212	60	23.6	
QD250/260-32-8D-CA	25.0~26.0	32	42	221	60	24.6	
inch	**inch**	**inch**	**mm**	**mm**	**mm**	**mm**	
QD5/16-11/32-1/2-8D-CA	5/16~11/32	1/2	16	76	45	7.5	8-11.9
QD23/64-25/64-1/2-8D-CA	23/64~25/64	1/2	16	85	45	8.8	
QD13/32-27/64-5/8-8D-CA	13/32~27/64	5/8	20	93	48	9.9	
QD7/16-15/32-5/8-8D-CA	7/16~15/32	5/8	20	102	48	10.7	
QD31/64-1/2-5/8-8D-CA	31/64~1/2	5/8	20	110	48	11.9	12-16.9
QD33/64-35/64-1/2-8D-CA	33/64~35/64	5/8	20	119	48	12.6	
QD9/16-37/64-1/2-8D-CA	9/16~37/64	5/8	25	127	48	13.8	
QD19/32-5/8-3/4-8D-CA	19/32~5/8	3/4	25	136	50	14.5	
QD41/64-21/32-3/4-8D-CA	41/64~21/32	3/4	25	144	50	15.6	
QD43/64-45/64-3/4-8D-CA	43/64~45/64	3/4	25	153	50	16.7	17-20.9
QD23/32-47/64-1-8D-CA	23/32~47/64	1	32	161	56	17.6	
QD3/8-25/32-1-8D-CA	3/8~25/32	1	32	170	56	18.4	
QD51/64-13/16-1-8D-CA	51/64~13/16	1	32	178	56	19.6	
QD53/64-55/64-1-8D-CA	53/64~55/64	1	32	187	56	20.4	21-26
QD7/8-57/64-1-8D-CA	7/8~57/64	1	32	195	56	21.6	
QD29/32-59/64-1 1/4-8D-CA	29/32~59/64	1 1/4	42	204	60	22.4	
QD61/64-31/32-1 1/4-8D-CA	61/64~1/32	1 1/4	42	212	60	23.6	
QD63/64-1-1 1/4-8D-CA	63/64~1	1 1/4	42	221	60	24.4	

EcoCut

Mono Tip Line Toolholders



Order No.	Applicable cutting head Dia.(mm)	Dimensions(mm)					Wrench
		d	D3	L1	Ls	D	
QD120/12916-12D-CA	12.0~12.9	16	20	162	48	11.6	12-16.9
QD130/139-16-12D-CA	13.0~13.9	16	20	175	48	12.6	
QD140/149-16-12D-CA	14.0~14.9	16	20	187	48	13.6	
QD150/159-20-12D-CA	15.0~15.9	20	20	200	50	14.6	
QD160/169-20-12D-CA	16.0~16.9	20	20	212	50	15.6	
QD170/179-20-12D-CA	17.0~17.9	20	20	225	50	16.6	17-20.9
QD180/189-25-12D-CA	18.0~18.9	25	32	237	56	17.6	
QD190/199-25-12D-CA	19.0~19.9	25	32	250	56	18.6	
QD200/209-25-12D-CA	20.0~20.9	25	32	262	56	19.6	
QD210/219-25-12D-CA	21.0~21.9	25	32	275	56	20.6	21-26
QD220/229-25-12D-CA	22.0~22.9	25	32	287	56	21.6	
QD230/239-32-12D-CA	23.0~23.9	32	42	300	60	22.6	
QD240/249-32-12D-CA	24.0~24.9	32	42	313	60	23.6	
QD250/260-32-12D-CA	25.0~26.0	32	42	325	60	24.6	
inch	**inch**	**inch**	**mm**	**mm**	**mm**	**mm**	
QD31/64-1/2-5/8-12D-CA	31/64~1/2	5/8	20	162	48	11.9	12-16.9
QD33/64-35/64-1/2-12D-CA	33/64~35/64	5/8	20	175	48	12.6	
QD9/16-37/64-1/2-12D-CA	9/16~37/64	5/8	25	187	48	13.8	
QD19/32-5/8-3/4-12D-CA	19/32~5/8	3/4	25	200	50	14.5	
QD41/64-21/32-3/4-12D-CA	41/64~21/32	3/4	25	212	50	15.6	
QD43/64-45/64-3/4-12D-CA	43/64~45/64	3/4	25	225	50	16.7	17-20.9
QD23/32-47/64-1-12D-CA	23/32~47/64	1	32	237	56	17.6	
QD3/8-25/32-1-12D-CA	3/8~25/32	1	32	250	56	18.4	
QD51/64-13/16-1-12D-CA	51/64~13/16	1	32	262	56	19.6	
QD53/64-55/64-1-12D-CA	53/64~55/64	1	32	275	56	20.4	21-26
QD7/8-57/64-1-12D-CA	7/8~57/64	1	32	287	56	21.6	
QD29/32-59/64-1 1/4-12D-CA	29/32~59/64	1 1/4	42	300	60	22.4	
QD61/64-31/32-1 1/4-12D-CA	61/64~1/32	1 1/4	42	313	60	23.6	
QD63/64-1-1 1/4-12D-CA	63/64~1	1 1/4	42	325	60	24.4	

How To Attach Inserts

Fix drill holder on arbor For insert exchange,fix arbor on the machine or set on toolpresetter 1

Remove dust using air blast 2

Put insert into drill holder. (Use gloves to protect your hand from any danger) 3

Turn lightly in a clockwise direction (Use gloves to protect your hand from any danger) 4

Set the wrench properly 5

Make sure the wrench fits with inserts slot for the wrench 6

Slot For Wrench

Turn the wrench in a clockwise direction slowly, then turn strongly while passing self-locked face until insert won't move 7

Complete 8

How To Detach Inserts

Remove dust from insert using air blast 1

Set the wrench roperly 2

Fit the wrench to insert slot 3

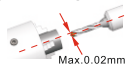
Turn the wrench in acounter-clockwise direction 4

Once self-lock is released,insert can be turned by fingers (Use gloves to protect your hand from any danger) 5

Remove insert (Use gloves to protect your hand from any danger) 6

Usage Precautions core deviation

1) For Turning



Set deviation amount under0.02mm between workpiece and drill

2) For Drilling

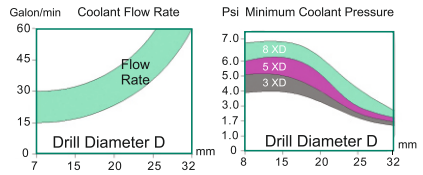
Do not use any arbor with a deformed attachment surface. Center of arbor deviation must be within 0.02mm

Coolant

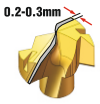
1 Internal coolant is recommended

2 In case of external coolant,cutting depth must be 3xD or less

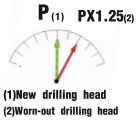
3 Dry cutting is not recommended



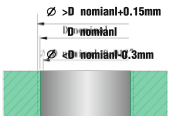
Indication of Drill Head Wear



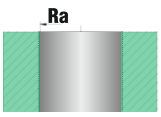
a) Wear Limit



b) Power Restriction



c) Diameter Change



d) Surface Finish Deterioration

E) Vibration Noise Drastically Increases

Application Recommendation Workpiece Shape

Flat Face Recommended

Hole Expansion Not Recommended

Stacked Plates Recommended (absolutely do not move between plates)

Slanted Surface Not Recommended

Concave Surface Recommended (reduce a half of feed tate as narmal)

Half Cylindrical Not Recommended

Pipe Material Recommended

Cored Hole Not Recommended

Material Groups

Recommended Machining Conditions

ISO	Material		Condition	Tensile Strength Rm[N/mm2]	Hardness HB	V m/min	Feed vs. Drill Diameter D<8	D=8-9.9	D=10-11.9	D=12-13.9	D=14-15.9	D=16-19.9	D=20-25.9	D=26-32.9
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	420	125	80-110-140	0.09 0.11 0.13	0.12 0.17 0.22	0.15 0.21 0.28	0.18 0.24 0.30	0.20 0.27 0.35	0.25 0.35 0.45	0.25 0.35 0.45	0.30 0.40 0.50
		>=0.25% C	Annealed	650	190	80-105-130								
		<0.55% C	Quenched and tempered	850	250	80-100-120								
		>=0.55% C	Annealed	750	220	70-90-110								
			Quenched and tempered	1000	300	50-70-90								
	Low alloy steel and cast steel (less than 5% alloying elements)		Annealed	600	200	80-100-120	0.09 0.12 0.15	0.12 0.18 0.25	0.14 0.21 0.28	0.16 0.24 0.32	0.18 0.26 0.35	0.23 0.31 0.40	0.25 0.35 0.45	0.30 0.40 0.50
			Quenched and tempered	930	275	70-90-110								
				1000	300	50-70-90								
				1200	350	40-55-70								
	High alloy steel,cast steel and tool steel		Annealed	680	200	50-70-90	0.09 0.11 0.12	0.12 0.16 0.20	0.12 0.17 0.22	0.15 0.20 0.25	0.18 0.23 0.28	0.20 0.25 0.30	0.22 0.27 0.33	0.25 0.30 0.35
			Quenched and tempered	1100	325	40-60-80								
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	40-55-70	0.08 0.09 0.10	0.10 0.12 0.15	0.12 0.15 0.18	0.14 0.17 0.20	0.16 0.20 0.24	0.16 0.21 0.26	0.18 0.24 0.30	0.20 0.27 0.35
			Martensitic	820	240	40-55-70								
			Austenitic	600	180	30-50-70								
K	Grey cast iron (GG)		Ferritic/martensitic		180	90-125-160	0.12 0.15 0.18	0.15 0.22 0.30	0.20 0.27 0.35	0.25 0.32 0.40	0.30 0.37 0.45	0.35 0.45 0.55	0.35 0.47 0.60	0.40 0.50 0.60
			Pearlieic		260	80-110-140								
	Cast iron nodular (GGG)		Ferritic		160	90-135-180								
			Pearlieic		250	80-110-140								
	Malleabie cast iron		Ferritic		130	90-125-160								
			Pearlieic		230	80-110-140								
N	Aluminum-wrought alloy		Not cureable		60	90-155-220		0.20 0.27 0.35	0.25 0.32 0.40	0.30 0.37 0.45	0.35 0.42 0.50	0.40 0.50 0.60	0.45 0.57 0.70	0.50 0.67 0.75
			Cured		100									
	Aluminum-cast,alloyed	<=12% Si	Not cureable		75									
			Cured		90									
		>12% Si	High temperature		130	80-120-160								
	Copper alloys	>1% Pb	Free cutting		110	90-155-220								
			Brass		90									
			Electrolitic copper		100									
	Npn-metallic		Duroplastics,fiber plastics											
			Hard rubber											
S	High temp.alloys	Fe based	Annealed		200	30-45-60	0.05 0.06 0.07	0.06 0.08 0.11	0.08 0.10 0.13	0.10 0.12 0.15	0.12 0.15 0.18	0.12 0.16 0.20	0.14 0.18 0.22	0.16 0.20 0.25
			Cured		280	20-35-50								
	Super alloys	Ni or Co based	Annealed		250									
			Cured		350									
			Cast		320									
	Titanium,Tialloys			Rm 400		20-35-50	0.05 0.06 0.07	0.06 0.09 0.12	0.08 0.11 0.15	0.10 0.14 0.18	0.12 0.16 0.20	0.14 0.18 0.22	0.16 0.20 0.25	0.18 0.22 0.27
			Alpha+beta alloys cured	Rm 1050										
H	Hardened steel		Hardened		55HRc	20-35-50	0.05 0.06 0.07	0.06 0.09 0.12	0.08 0.11 0.15	0.10 0.14 0.18	0.12 0.16 0.20	0.14 0.18 0.22	0.16 0.20 0.25	0.18 0.22 0.27
			Hardened		60HRc									
	Chilled cast iron		Cast		400									
	Cast iron		Hardened		55HRc									

■ Recommended cutting data

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