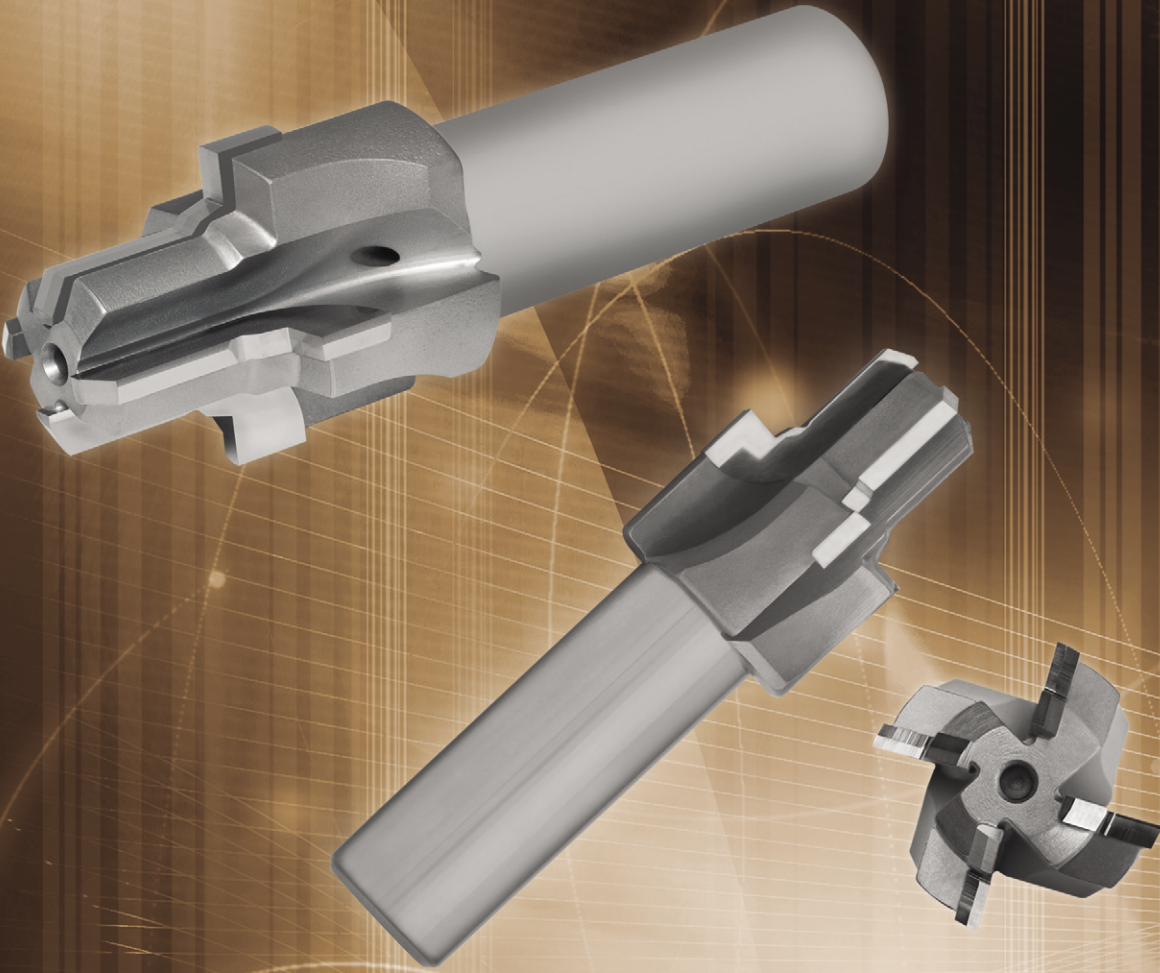




PORT TOOLS



Tapered Pipe Reamer

BSP

MS16142

ISO6149

MS33649

AND10050

MS33514

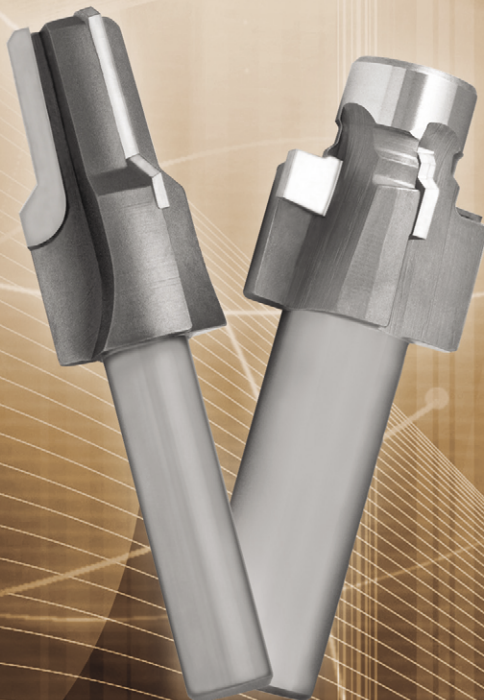
RPT/RPTF (Rosan)

Hydraforce

MS21921

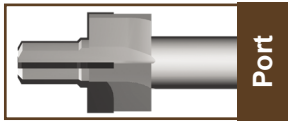
MS33651

Coolant Through

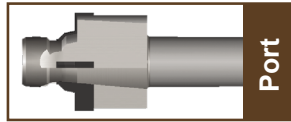


PORT TOOL PRODUCT OVERVIEW

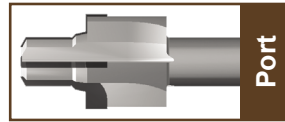
All Port Tools are ground between centers to ensure absolute concentricity. They are made from heat-treated alloy steel with brazed carbide inserts. They are designed to enlarge a pre-drilled hole and easily produce a complex form. Port Tools can be used for both lathe and mill applications. Technical information available on page 108. **Modified Port Tools and Specials** quoted upon request.



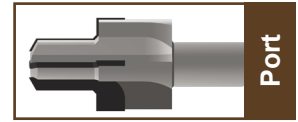
MS33651 (p.91)
This carbide tipped port tool also meets the requirements of the AND10071 port.



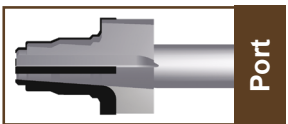
MS16142-S (p.91)
This port is also called the O-Ring Boss or ORB, SAEJ1926-1, SAEJ514 or just SAE (dash number). The solid pilot design does not cut the minor-thread diameter.



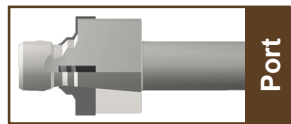
MS16142-R (p.92-93)
This port is also called the O-Ring Boss or ORB, SAEJ1926-1, SAEJ514 or just SAE (dash number). The reamer pilot design cuts the minor-thread diameter.



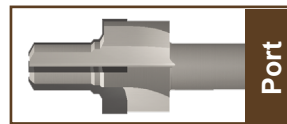
BSPP- Pipe Reamer (p.94)
British standard parallel pipe port tools (PT-BSPP) cut the minor-thread diameter, the 45° angle, and the spot face.



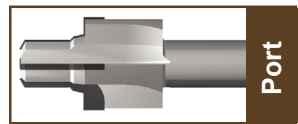
BACD2036 (p.94)
BACD2036 carbide tipped port tools are designed to cut this otherwise difficult-to-cut port.



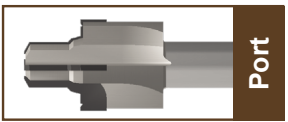
MS33649-S (p.95)
This port is also called the AS5202. The solid pilot design does not cut the minor-thread diameter.



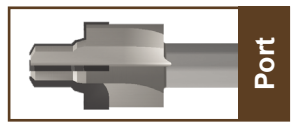
MS33649-R (p.96-97)
This port is also called the AS5202. The reamer pilot design cuts the minor-thread diameter.



ISO 6149/1 (p.98)
This is also called the SAEJ2244-1. This port does not have the identification notch that identifies it as a metric port.



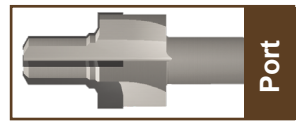
ISO 6149/1 (ID) (p.99)
This port is also called the SAEJ2244-1. This port has the identification notch that identifies it as a metric port.



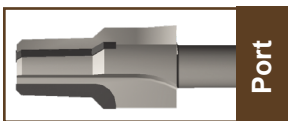
ISO 6149/1 (SF) (p.100)
This port is also called the SAEJ2244-1. This port has a larger spot face without the identification notch.



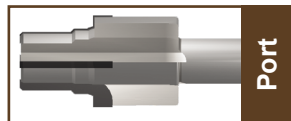
AND10050-S (p.101)
The solid pilot design does not cut the minor-thread diameter.



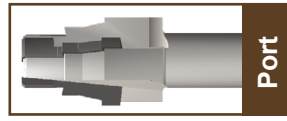
AND10050-R (p.102)
The reamer pilot design cuts the minor-thread diameter.



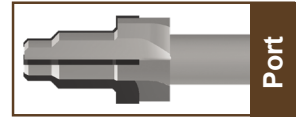
Tapered Pipe Reamer (p.103)
The (PRSS) tapered pipe reamers cut taper minor diameter of the NPT (1°47' angle) and the 45° countersink for the thread.



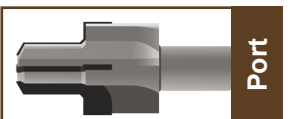
RPT/RFPT (p.104-105)
RPT/RFPT port tool will cut a Rosan cavity per AS1300 specification. Another name for this port is PS10035.



MS33514 (p.106)
This port will cut the AS33514, MS33514 and MS33515 in both style "E" and "G" configurations.



MS21921 (p.107)
MS21921 port tools are made with the same quality heat-treated steel and carbide as the rest of our port tools.



ISO 1179
1179 port tools cut the minor thread (BSPP) diameter, 90 degree included angle, and the spot face per the requirements of ISO 1179.

PORT & CAVITY TECHNICAL INFORMATION

MATERIAL	HB/Rc	SPEED (SFM)		CUTTING CONDITIONS	
		UNCOATED	ALTiN+	INFEEED PER FLUTE REAM	INFEEED PER FLUTE SPOT FACE
CAST IRON	130 HB	75-210	200-450	.001-.0025	.0008-.0020
CARBON STEEL	18 Rc	125-190	190-400	.001-.0030	.001-.0020
ALLOY STEEL	20 Rc	70-135	130-350	.001-.0030	.0008-.0020
TOOL STEEL	25 Rc	75-100	100-220	.001-.0025	.0005-.0020
300 STAINLESS STEEL	150 HB	90-100	100-230	.001-.0020	.0007-.0015
400 STAINLESS STEEL	195 HB	90-135	135-300	.001-.0020	.0005-.0015
HIGH TEMP ALLOY (NICKEL & COBALT BASE)	20 Rc	30-125	100-150	.0008-.0015	.0005-.0010
TITANIUM	25 Rc	50-100	100-140	.001-.0020	.0005-.0010
HEAT TREATED ALLOYS (38-45Rc)	40 Rc	50-75	75-130	.0008-.0015	.0005-.0010
ALUMINUM	100 HB	850-1000	800-1500	.002-.0040	.0010-.0030
BRASS, ZINC	80 HB	750-950	800-1200	.002-.0040	.0010-.0030

SFM = Surface Feet per Minute

RPM = SFM x 3.82 divided by tool diameter

Starting parameters only. Setup and machine rigidity may affect performance.

PROBLEM	CAUSE	SOLUTION
RAPID FLANK WEAR	CUTTING CONDITIONS	Check for excessive speed and feed - see chart.
	TOOL	Select a coated tool.
	PROGRAM	Remove dwell from program at end of cut.
BUILT-UP EDGE	TOOL	Select a coated tool. The coating will resist built-up edges.
	HEAT	Use coolant through port tool. If coolant is not available, use shop air and a coated tool.
SURFACE TORN	TOOL	Use a coated tool. On most carbon steels, an uncoated tool will not produce an acceptable finish.
CHATTER	TOOL	Hone cutting edge of spot face. Use Coated Tool. Increase chip load.
LIGHT CHATTER	PROGRAM	Increase speed by 15-20%. A faster speed reduces forces. A dwell typically will not remove chatter.
POOR TOOL LIFE	AMOUNT OF STOCK	Rough port to 0.97 inch of finish size.
	PART	Make sure prior operation did not work harden the material.

SAMPLE PROGRAM FOR MAXIMUM PRODUCTIVITY

N51 (Sample Port Tool Program: MS33649-4RA (ALTiN+) cutting Carbon Steel

T51 M06

Select Tool

S2916 M03

SFM = 300 ; RPM = 300 x 3.82 / Reamer Diameter

G00 G90 G54 X0. Y0.

RPM = 300 X 3.82 / 0.393

G43 H51 Z0.1 M08

RPM = 2916

G01 Z-0.6 F23.3

Feed Rate = RPM x 0.002 x 4 (Number of Flutes)

S1290 M03

RPM = 300 x 3.82 / 0.888 (Spot Face Diameter)

G04 P1.

Dwell to slow down spindle

G01 Z-.73 F10.3

Feed rate = RPM x 0.002 x 4 (Number of Flutes)

G00 Z5. M09