

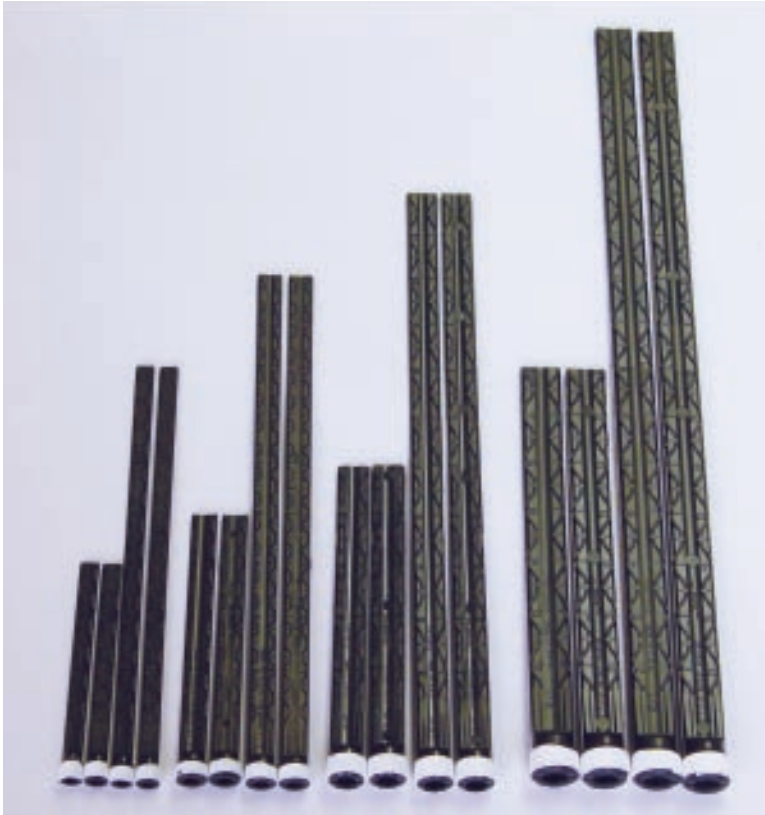
D-M-E Turbulent Flow Plastic Baffles

Superior mold cooling
performance versus
traditional brass baffles



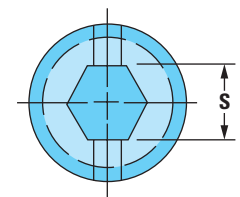
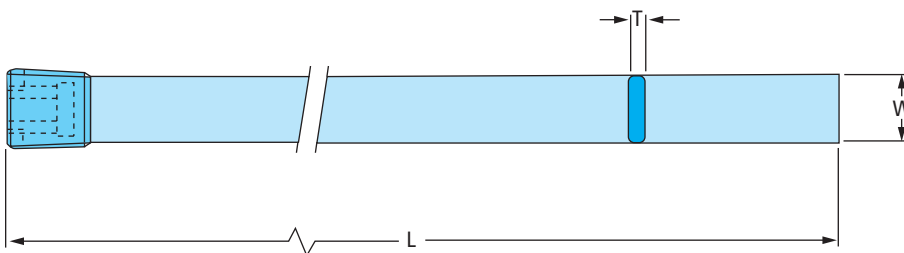
Benefits of Turbulent Flow Plastic Baffles

Improve mold cooling performance over traditional brass baffles



Turbulent Flow Plastic Baffles Benefits

- Patented side wipers prevent coolant blow-by, ensuring coolant flow to the end of baffles
- Results in better cooling of targeted hot spots
- Dramatically improves cooling time
- Increases coolant flow velocity and lowers Delta "T" across mold surface
- Built-in ribs encourage turbulent flow and reduce stagnant laminar flow
- Turbulent flow dissipates about 3x the BTUs as compared to laminar flow
- Non-hygroscopic, glass-reinforced engineering thermoplastic (polyphthalamide) excels under high heat, providing better temperature stabilization
- Pre-wrapped with Teflon® tape
- Maximum coolant temperature recommended: 100°C (212°F)



Slot indicates baffle position

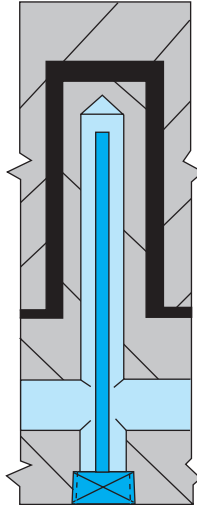
Turbulent Flow Plastic Baffles (Inch) – PBF

ITEM NUMBER	NOMINAL PLUG SIZE	S HEX SIZE	L NOMINAL OVERALL LENGTH	T BAFFLE THICKNESS	W BAFFLE WIDTH	DRILL SIZE
PBF0125-04	1/8	3/16	4"	1/16	5/16	5/16
PBF0125-08	1/8	3/16	8"	1/16	5/16	5/16
PBF0250-05	1/4	1/4	5"	3/32	7/16	7/16
PBF0250-10	1/4	1/4	10"	3/32	7/16	7/16
PBF0375-06	3/8	5/16	6"	3/32	9/16	9/16
PBF0375-12	3/8	5/16	12"	3/32	9/16	9/16
PBF0500-08	1/2	3/8	8"	3/32	11/16	11/16
PBF0500-16	1/2	3/8	16"	3/32	11/16	11/16
PBF0750-12	3/4	9/16	12"	1/8	15/16	15/16
PBF0750-20	3/4	9/16	20"	1/8	15/16	15/16
PBF0750-24	3/4	9/16	24"	1/8	15/16	15/16

Guidelines to Efficient Water Cooling

- Ensure good coolant flow rates (Reynolds number of 4000 minimum. See Reference Table below.)
- The golden rule for optimum cooling is to maximize GPM (gallons per minute). D-M-E recommends in-line coolant flow meter usage. In-line coolant flow meters are available from D-M-E Molding Supplies. www.dme.net/moldingsupplies/coolantflow.pdf
- Coolant feed channels should be the same size or larger than the calculated coolant channel
- Keep coolant channels clean with filtering and scheduled channel maintenance to de-scale coolant channels
- Use parallel cooling versus series cooling, as appropriate
- Minimize restrictions within cooling circuit

Typical Applications



Reynolds Number

In fluid mechanics, the Reynolds number is the ratio of inertial forces to viscous forces and quantifies the relative importance of these two types of forces for given flow conditions.

Turbulent Flow Reference Table

APPROXIMATE MINIMUM FLOW (in gallons per minute)		
PIPE SIZE NPT	DRILLED PASSAGE I.D.	FLOW RATE GPM
	INCHES	
1/16 NPT	0.250"	0.33
1/8 NPT	0.339"	0.44
1/4 NPT	0.438"	0.55
3/8 NPT	0.593"	0.74
1/2 NPT	0.719"	0.9
3/4 NPT	0.938"	1.17
1 NPT	1.156"	1.44

Approximate Minimum Flow (in gallons per minute) required for turbulent flow in drilled water passages based on a Reynolds number of 4000.

How to Check Coolant Flow Rate

- Remove the exit hose from a mold-cooling channel and fill a 1- or 5-gallon container while measuring the amount of time it takes to fill the container.
- Calculate the amount of coolant that flowed through the exit hose into the container.
 - > For example, filling a 5-gallon container in 8 minutes is a flow rate of .625 gallons per minute (5 over 8 or $5/8 = .625$)
 - > .625 gallons per minute is a very good flow rate for a 1/4 NPT cooling channel. However, this would NOT be turbulent flow for a 3/8 NPT flow channel.
- Additionally, many other factors influence the cooling process, including coolant channel placement, distance the cooling channels are from the cavity or core molding surface, distance between each cooling channel, and the number of cooling channels.
- Furthermore, if water deposits such as lime and other hard water mineral deposits are allowed to accumulate, the walls of the cooling channels will become insulated. Turbulent flow is less beneficial under these conditions.
 - > Practice filtering the coolant along with regularly scheduled coolant channel maintenance to de-scale coolant channels.
- Mold materials also play a significant role in cooling time. For example, replacing 420 Stainless Steel cores with a Copper Alloy such as Moldstar (as supplied by D-M-E) can significantly reduce cycle time.
- Lastly, remember that regular cooling channel maintenance and turbulent water flow rates for the size of the cooling channels will have an enormous effect on the mold's cooling capacity.

TURBULENT FLOW PLASTIC BAFFLE INSTALLATION INSTRUCTIONS

The plastic baffle is installed in standard gun-drilled cooling channels and CNC-standard NPT-F holes.

- Recommended tolerance for cooling channels is +/-0.05"
- Clearance must be provided between end of baffle and end of drilled channel to provide adequate flow
- One-inch increments are marked on each side of the baffle blade
- Baffle blades may be cut or snapped at marked one-inch increments to obtain preferred dimension (smooth the top edge after proper sizing)
- Do not expose the baffle to flame cutting

The plastic baffle has a molded wiper on both sides of the blade that travels the length of the blade. This allows the thin wiper to make contact with the inside walls of the water line thereby sealing them off and prohibiting blow-by.

- Make sure the thread seal tape is not damaged
- Turn the baffle clockwise when installing so the baffle blade bends the wipers over as they are installed into the water line. This seals the plastic blade to the water line holes.
- Do not thread and unthread the baffles, as this will diminish the sealing and performance properties

During tightening, the Allen wrench will become snug, indicating that the plug is sealed to the hole.

- Is it not recommended to force tightening beyond the wrench becoming snug
- Do not use a hammer to push the blade into the channel

If, for any reason, cooling channel cleaning is required, replace the baffle with a new one.

If the hex is damaged, a hand drill may be used to remove it.



See the complete line of D-M-E mold cooling products in our new Mold Components catalog.



World Headquarters D-M-E Company

29111 Stephenson Highway
Madison Heights, MI 48071
800-626-6653 *toll-free tel*
248-398-6000 *tel*
888-808-4363 *toll-free fax*
www.dme.net *web*
sales@dme.net *e-mail*

D-M-E of Canada, Ltd.

6210 Northwest Drive
Mississauga, Ontario
Canada L4V 1J6
800-387-6600 *toll-free tel*
905-677-6370 *tel*
800-461-9965 *toll-free fax*
dme_canada@dme.net *e-mail*

D-M-E Europe C.V.B.A.

Industriepark Noord
B-2800 Mechelen Belgium
32-15-215011 *tel*
32-15-218235 *fax*
sales@dmeeu.com *e-mail*