MATERIALS

BETE manufactures nozzles in hundreds of different materials and combinations of materials. The chart on this page shows the 40 materials most often specified. If you don't know which material is best for your application, BETE Applications Engineering can help you with your selection. Some factors that influence the nozzle material selection process are:

Temperature. Melting or softening of material establishes maximum temperature limits. However, these temperature limits must be reduced when corrosion, oxidation, or chemical attack are also present. See column in blue for general temperature limits for various materials.

Corrosion. Plastics offer superior corrosion resistance at relatively low cost, but can only be used in low-temperature applications. In general, metals can be ranked in the following order of corrosion resistance (from lowest to highest): cast iron, brass, stainless steels, nickel-based alloys, refractory metals and precious metals. Ceramics have excellent corrosion resistance except in very high pH environments.

Chemical attack. There are few general guidelines to this complex subject, but the material used for piping may provide a useful indicator of a suitable nozzle material. If the environment of your application is known to contain substances which may attack the spray nozzle, contact BETE Applications Engineering for advice.

Abrasion. Hardened stainless steel, Cobalt Alloy 6, tungsten carbide, and ceramics are commonly used in applications where abrasive fluids are sprayed.

Cost. There are exceptions, but materials can generally be ranked in the following order in terms of cost (from lowest to highest): brass, cast iron, plastics, stainless steels, cobalt-base alloys, nickel-base alloys, ceramics, refractory metals and precious metals.

Material Description	BETE Material No. (MN)	(DIN) Description	Temp. Rating (° C)	Trade Name*	U.S. ASTM or AMS Cast Specification	U.S. ASTM Bar Specification
Brass	4	Messing	230°		B30 C85700	B16 C36000
Naval Brass	64		400°		B21 C46400	
Bronze		Bronze	400°		B30 C95400	B103 C54400
L.C. Steel	72	C-Stahl	210°			A108 Gr 12L14
Cast Iron	28	Gusseisen	230°			
303	5	1.4305	430°		A 743 CF-16F	A582 S30300
304	6	1.4301	430°		A 743 CF-8	A276 S30400
304L		1.4306	430°		A 743 CF-3	A276 S30403
316	7	1.4401	430°		A 743 CF-8M	A276 S31600
Tungsten Carbide	7H					
Alumina	26					
316L	20	1.4404	430°		A 743 CF-3M	A276 S31603
317	21	1.4440	430°		A 743 CG-8M	A276 S31700
317L	22	1.4438	430°		A 743 CG-3M	A276 S31725
416		1.4005	430°			A582 S41600
904L	74	1.4539	430°			
Alloy 20	70	2.4660	490°	Carpenter® 20	A 743 CN-7M	B473 N08020
Nickel Alloy M30C	37	2.4360/2.4366	540°	Monel®	A 494 M-30C	B164 N04400
Nickel Alloy 600	35	2.4816	1100°	Inconel® 600		
Nickel Alloy 625	3B	2.4856	1100°	Inconel® 625	AMS 5402	B446 N06625
Nickel Alloy 800	33	1.4876	1010°	Incoloy® 800		B408 N08800
Nickel Alloy 825		2.4858	1010°	Incoloy® 825		B425 N08825
Nickel Alloy B	31	2.4800/2.4810	760°	Hastelloy® B w/2.5 Max. Co	A 494 N-12MV	B335 N10665
Nickel Alloy G	32	2.4619	1100°	Hastelloy® G	B 581 N06007	B581 N06007
Nickel Alloy G30	49	2.4603	1100°	Hastelloy® G30		B581 N06030
Nickel Alloy C276	81	2.4819	1100°	Hastelloy® C276		B574 N10276
Nickel Alloy C22	2A	2.4602	1100°	Hastelloy® C22	A 494 CX-2MW	B574 N06022
Nickel	38	Nickel	350°			B160 N02200
Titanium	11	Titan	540°			B348 Gr 2
Tantalum	40	Tantal	1500°			B708 R05200
Zirconium	61	Zirkonium	540°			B550 R60702
Cobalt Alloy 6	9		1050°	Stellite® 6	AMS 5387	
SNBSC ceramic	62		1660°	Refrax®		
RBSC ceramic	59		1380°			
PTFE	3	PTFE	150°	Teflon®		D1710 G1, T2, CA
PVDF	36	PVDF	120°	Kynar®		D3222 Tp 1, Cl 2
PVC	1	PVC	60°			
CPVC	16	CPVC	100°			
Polypropylene	2	Polypropylen	70°			
UHMW	17		80°			
Polyurethane	69		80°			
ABS	15		70°			

*** BETE does not represent that it manufactures its products with materials sold under any of these brand names.** Customers sometimes ask for BETE products without using a USA standard specification for the material they require. When materials are described incompletely, with DIN specifications or with a commonly used brand name, BETE will usually supply materials according to the USA specifications listed above. Specifications for forms other than cast or bar may differ from the above.