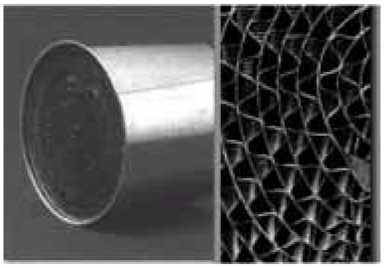
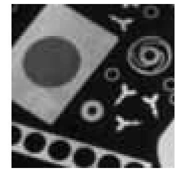


Metglas® Brazing Foil & Preforms

Components with rigid dimensional tolerances and high strength/stiffness-to-weight ratios are needed to handle the stresses and heat, inherent in aerospace, heat exchanger, and automotive exhaust applications. ***Metglas®*** Brazing Foils (MBFs) from ***Metglas, Inc.*** are produced as thin as 25 µm (1 mil) to satisfy these requirements. It gives consistently reliable and strong joints.

MBFs Provide extensive manufacturing and performance advantages over conventional metal joining methods.



Metglas® Brazing Foil Benefits

Unique foil form combined with outstanding ductility – MBF bends 180° without fracturing to comply with complex joint geometries to ease fixturing; ductile enough to be mechanically stamped and shaped to 3-D configurations.

Ease of automation – for enhanced manufacturing efficiency.

Consistent Performance – eliminates waste and creates high quality joints.

Unlimited shelf life

Contaminant free – for prolonged brazing furnace life.

Fast melting and outstanding wetting and flow – for void free, optimum strength joints.

Wide range or products – covering *brazing temperatures from 950°C (1742°F) to 1195°C (2183°F).*

Wide range of widths – for easy brazing of small and large areas.

Range of thicknesses available – for optimized joint gaps, including very thin foil, 25µm (1 mil) for decreased erosion of base metal.

Advantages of Brazing with Metglas® Brazing Foils

Vs. Mechanically-fastened joints
MBF provides higher strength, leak tightness and superior resistance to shock and vibration. Lighter gauge base metals may be used for substantial weight savings since MBF provides continuous, uniform joints.

Vs. Adhesive bonding and soldering
MBF offers superior strength, flexibility and temperature resistance.

Vs. Welding
MBF provides much higher processing efficiency. The lower melting temperature of MBF eliminates erosion of base metals. No cleaning or finishing is required.

Vs. Powder, paste and tape forms of brazing
MBF contains no organic binders, thus eliminating contaminating residues and reducing furnace cycle times. Completely homogeneous, 100% metal MBF alloy optimizes brazed joint formation and performance. Reliable melting and flow reduces rework and reject rate as well.

MBF Alloy	AWS & ASM Classifications	Nominal Composition, wt %								Melting Temp. C° (F°)		Braze Temp. (Approx.)	Density g/cm^3 (lbm/in^3)
		Cr	Fe	Si	C*	B	P	Mo	Ni	Solidus	Liquidus	C° (F°)	
15		13.0	4.2	4.5	0.03	2.8	-	-	Bal	965 (1769)	1103 (2017)	1135 (2075)	7.82 (0.283)
20	AWS BNi2 /AMS	7.0	3.0	4.5	0.06	3.2	-	-	Bal	969 (1776)	1024 (1875)	1055 (1931)	7.88 (0.285)
30	AWS BNi3/AMS	-	-	4.5	0.06	3.2	-	-	Bal	984 (1803)	1054 (1929)	1085 (1985)	8.07 (0.291)
50	AWS BNi-5a	19.0	-	7.3	0.08	1.5	-	-	Bal	1052 (1924)	1144 (2091)	1170 (2138)	7.70 (0.278)
51	AWS BNi-5b	15.0	-	7.25	0.06	1.4	-	-	Bal	1030 (1886)	1126 (2058)	1195 (2183)	7.73 (0.278)
53		15.0	-	7.25	0.06	1.4	-	5.0	Bal	1045 (1900)	1127 (2060)	1195 (2183)	7.75 (0.280)
60		-	-	-	0.10	-	11.0	-	Bal	883 (1621)	921 (1688)	950 (1742)	8.14 (0.294)
62		21.0	<1	0.5	-	0.5	8.0	1.0	Bal	878 (1612)	990 (1814)	1020 (1868)	7.74 (0.280)
64		17.5	4.0	6.0		0.75	5.0	1.0	Bal	913 (1675)	978 (1792)	1010 (1850)	7.68 (0.277)
80		15.2	-	-	0.06	4.0	-	-	Bal	1048 (1918)	1091 (1996)	1120 (2045)	7.94 (0.278)

** Maximum concentration*

METALLIC CATALYST SUBSTRATE

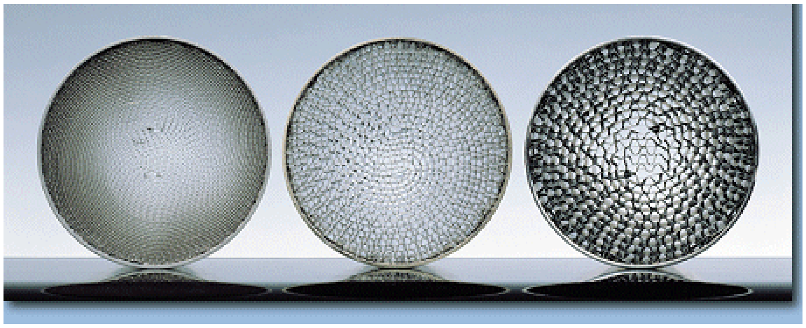
In recent years, metallic catalyst substrates have begun to replace the ceramic substrates used to filter emission particulates. In addition to being sturdier and resilient to vibration and enabling the unit to be mounted closer to the engine, the metallic substrates heat up faster to reduce harmful emissions.

Brazing Application

The cells of these units are formed by utilizing approximately 50 – 100 µm (2.0 – 4.0 mil) thick corrugated and flat sheet stock. The concentrically wrapped metal sheet must be securely fastened to itself to prevent vibration and potential release of catalyst during engine operation (which would result in unit failure). Brazing is an important technique for manufacturing the advanced metallic catalytic converters.

Solution

When using MBF instead of powder or pastes, smaller, high-quality fillets are formed. As a result, cells become more open, thereby reducing exhaust backpressure. MBF foils leave more effective surface area for the catalyst. Finally, process automation is easily achieved with ductile MBF foil.



The all-metal catalytic converters for automobiles and motorcycles brazed with MBF reach optimum performance levels quicker than their ceramic counterparts due to their faster heat-up time.

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NOTE: For a typical FeCrAl alloy, MBF50 with its low boron content provides superior high pressure strength and corrosion resistance with virtually no base metal erosion.