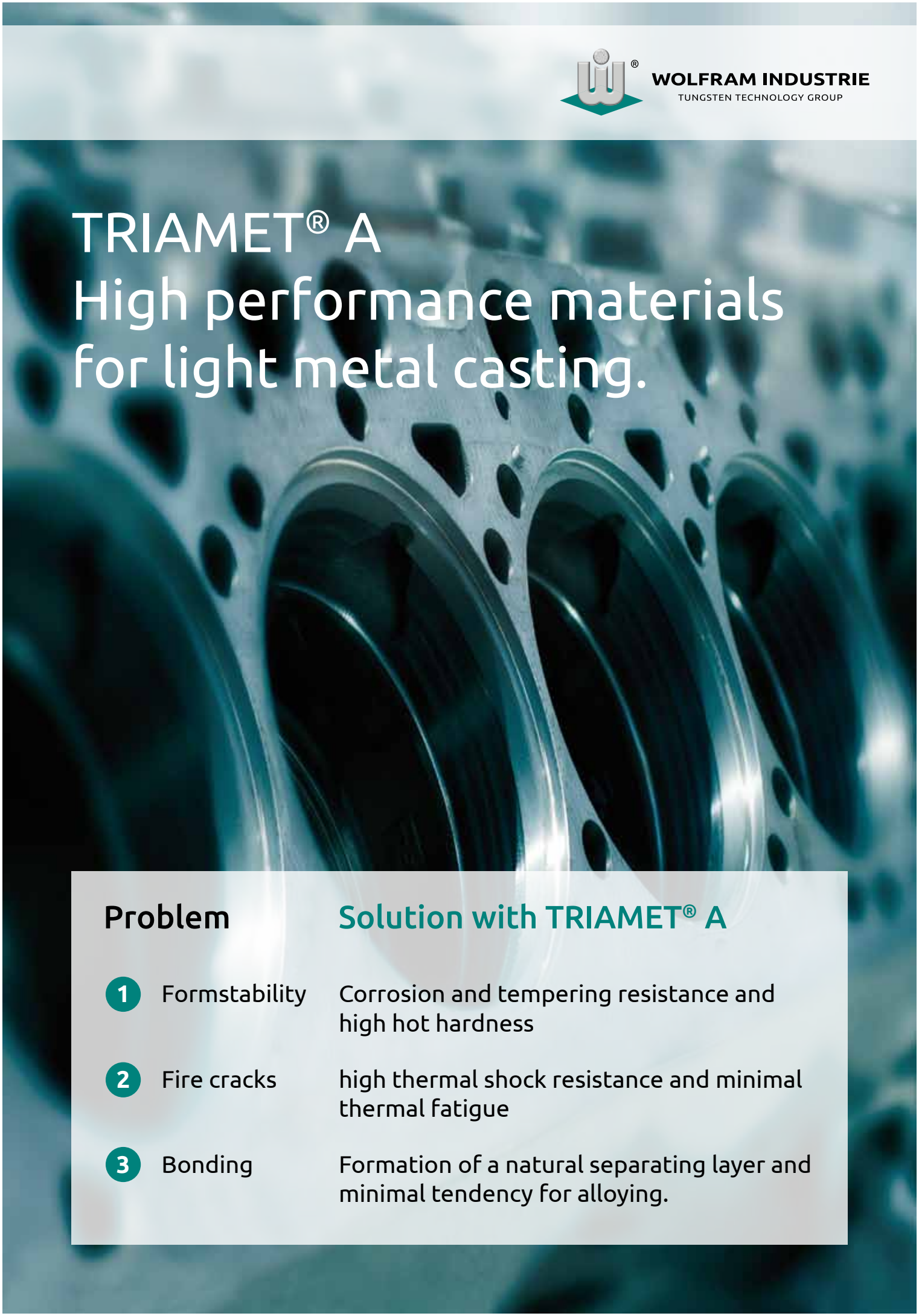
WOLFRAM INDUSTRIE
TUNGSTEN TECHNOLOGY GROUP

TRIAMET® A
High performance materials for light metal casting.



Problem	Solution with TRIAMET® A
1 Formstability	Corrosion and tempering resistance and high hot hardness
2 Fire cracks	high thermal shock resistance and minimal thermal fatigue
3 Bonding	Formation of a natural separating layer and minimal tendency for alloying.

TRIAMET® A – High performance materials for light metal casting

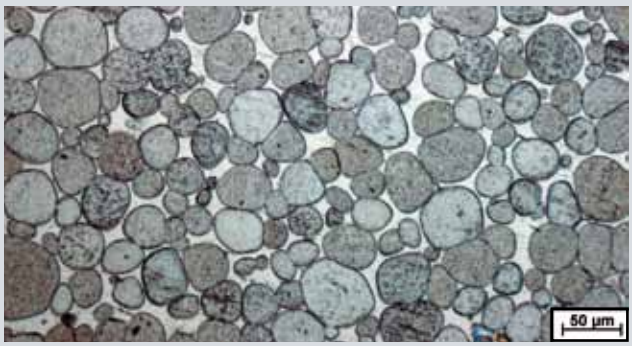
The material group TRIAMET® A possesses a high resistance to liquid aluminium and magnesium, a high thermal shock resistance and a minimal tendency for alloying.

TRIAMET® A materials contain large amount of tungsten with a melting point of 3410 degrees C. That is a prerequisite for a much higher standing time of cool cores and in distributors in aluminium hub production or cylinder head production.

The material TRIAMET® A is easily processed and significantly relieves the worker, since residues can be easily removed from the form.

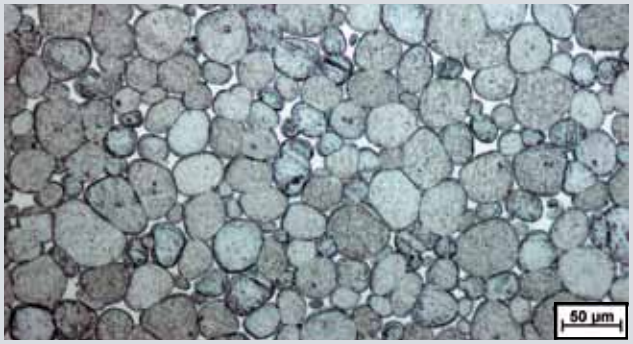
TRIAMET® A17 and A17 M

Perfect for the gravity die casting of various aluminium alloys at temperatures over 780 degrees C with great flow velocity in the sprue or the die.



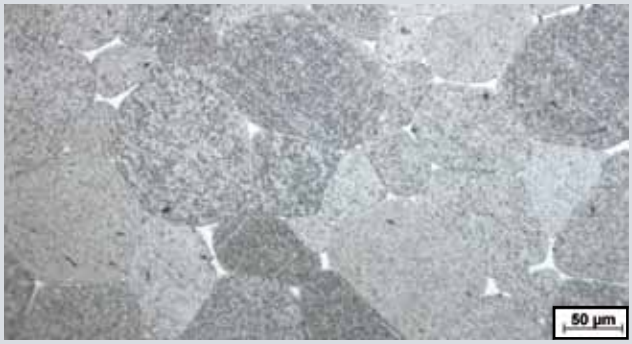
TRIAMET® A18

For sophisticated use in die casting, e.g. for mold inserts, shifting, and cores, avoids the formation of fire cracks.



TRIAMET® A18,5 and A19

Guarantee an extremely high corrosion resistance against aluminium, magnesium, and copper alloys.



Technical Data:	TRIAMET® A 17	TRIAMET® A 17 M	TRIAMET® A 18	TRIAMET® A 18,5	TRIAMET® A 19	EN/DIN 1.2343 BS BH11 AISI H11
Tungsten content [%]	90	90	95	97	98,2	---
Bonding phases	Ni, Fe	Ni, Fe, Mo	Ni, Fe	Ni, Fe	Ni, Fe	---
Hardness [HV10]	270 - 320	280 - 330	290 - 340	290 - 340	300 - 350	380 - 480
Density [g/cm³]	17,0 ± 0,15	17,2 ± 0,15	18,0 ± 0,2	18,5 ± 0,2	18,8 ± 0,2	8,0
Thermal conductivity (20 °C) [W/mK]	70	70	83	90	105	23
Thermal expansion coefficient (20 ° - 600 °C) [1/K]	6,45 × 10^{-6}	5,4 × 10^{-6}	5,2 × 10^{-6}	5,0 × 10^{-6}	4,8 × 10^{-6}	12,2 × 10^{-6}
Strength [MPa]	760 - 1000	700 - 950	750 - 950	690 - 880	650 - 800	1230 -1570
Elongation A_5 [%]	up to 30	up to 10	up to 25	up to 5	up to 5	
E-Module (20 °C) [GPa]	330	350	365	370	375	210

TRIAMET® A12

New high performance material for repairing at the canister

TRIAMET® A12 was developed for repairs when casting the materials TRIAMET® A17, TRIAMET® A17M, TRIAMET® A18, TRIAMET® 18.5, and TRIAMET® A19. It is also suitable for coats for increasing the service life of conventional hot-work steel.

It is distinguished by:

- Great corrosion resistance
- High tempering resistance for minimal surface erosion
- High thermal shock resistance for avoiding fire cracks

Processing instructions:

We recommend the WIG welding process (CD 150-180A). The weld metal runs smoothly. Greater layer thicknesses should be applied layer by layer.

The best results are achieved with bars 2.5 mm in diameter. A good gas protection until the molten bath is completely cooled is very important.

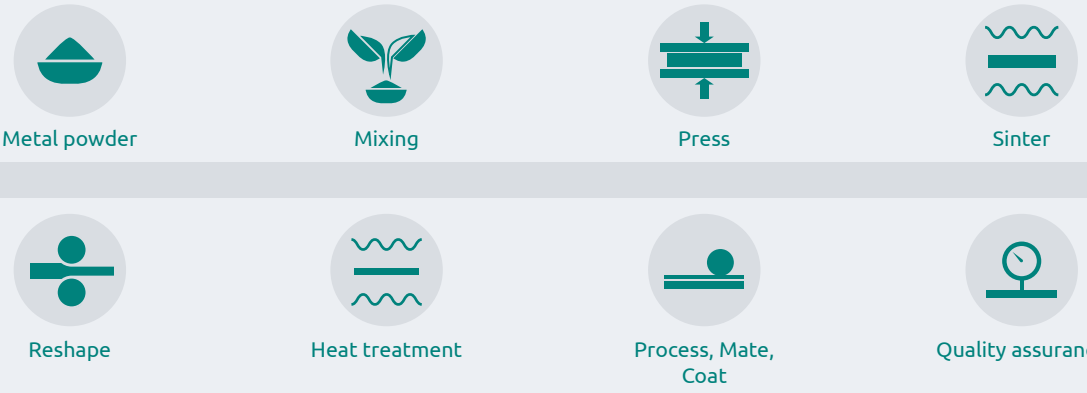
Technical data	TRIAMET® A 12	Hot-work steel 1.2343 (hardened and tempered)
Hardness [HV10]	> 280	380 - 480
Density [g/cm³]	12.1 ± 0.3	8.0
Thermal conductivity [W/mK]	ca. 48	23
Thermal expansion coefficient (20 ° - 800 °C) [1/K]	ca. 10 × 10^{-6}	12.2 × 10^{-6}

The production

The production of TRIAMET® heavy metal is produced from high-quality raw powders that are mixed in the appropriate combination and pressed together. Mass production components are compressed in matrix tools in hydraulic or mechanical metal powder presses. Semi-finished products, large sections, and individual pieces are formed through isostatic pressing.

The pressed part already exhibits up to 80 % of its final density according to the respective pressing procedure and compression pressure. This end density is finally reached during a subsequent liquid phase sintering at high temperatures. The sintered blanks produced in this way can now be turned into any desired gauge block by further mechanical processing.

From raw material to material: Only those who master the entire process can deliver more than the standard:



Forms of delivery

- Fully finished fittings according to customer specification
- Semi-finished products in the form of bars, slabs and blocks
- Blanks round, octagonal, or square, deliverable ex stock on short notice.

Additional information and instructions for safe handling can be found on our homepage.

Gesellschaft für Wolfram Industrie mbH · Permanederstrasse 34 · D-83278 Traunstein · Phone +49 (0) 861 9879-0 · Fax +49 (0) 861 9879-101
info@wolfram-industrie.de · www.wolfram-industrie.de

Bayerische Metallwerke GmbH · Leitenweg 5 · D-85221 Dachau · Phone +49 (0) 8131 703-0 · Fax +49 (0) 8131 703-102
info@wolfram-industrie.de · www.wolfram-industrie.de

14.01