

FERTILIZER PROCESS PRODUCTS

SYNGAS

AMMONIA

UREA

NITRATES

NITRIC ACID

MELAMINE

Across the complete production process of nitrogen and phosphate based fertilizers, melamine, nitric acid and syngas our range of DMV grades offer solutions to the most challenging of corrosive environments.

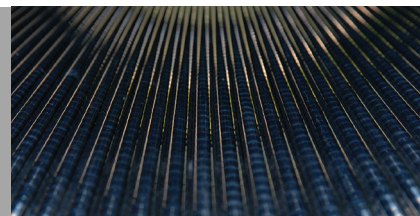
- Heat exchanger tubes for heat transfer between different corrosive process environments
- Pipes for process production
- Instrumentation tube for controlling and monitoring temperature and pressure

Products and Solutions

DMV 904 DMV 25.22.2
 DMV 316 LUG DMV 304L
Austenitic Stainless
 DMV 310S DMV 4335
 DMV 4439

Heat Exchanger tubes

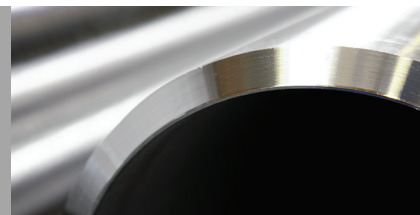
Up to 43 m long (110 ft)
 Straight or 'U' bent
 Carbamate condensers
 Scrubbers
 Strippers



DMV 25.7NS DMV 29.7
Duplex
 DMV 22.5 DMV 25.7N

Pipe

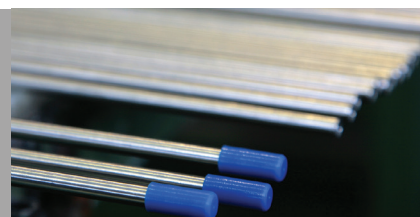
1/8" NB to 10" NB
 10.3 mm to 273.0 mm
 DN 3 to DN 250



DMV 59 DMV 931
Nickel Alloys
 DMV 928 DMV C276
 DMV 4692

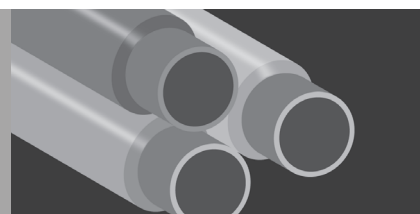
Instrumentation Tubes

6 mm (1/4") to 25 mm (1")
 outside diameter

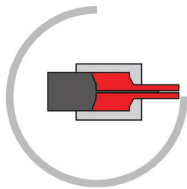
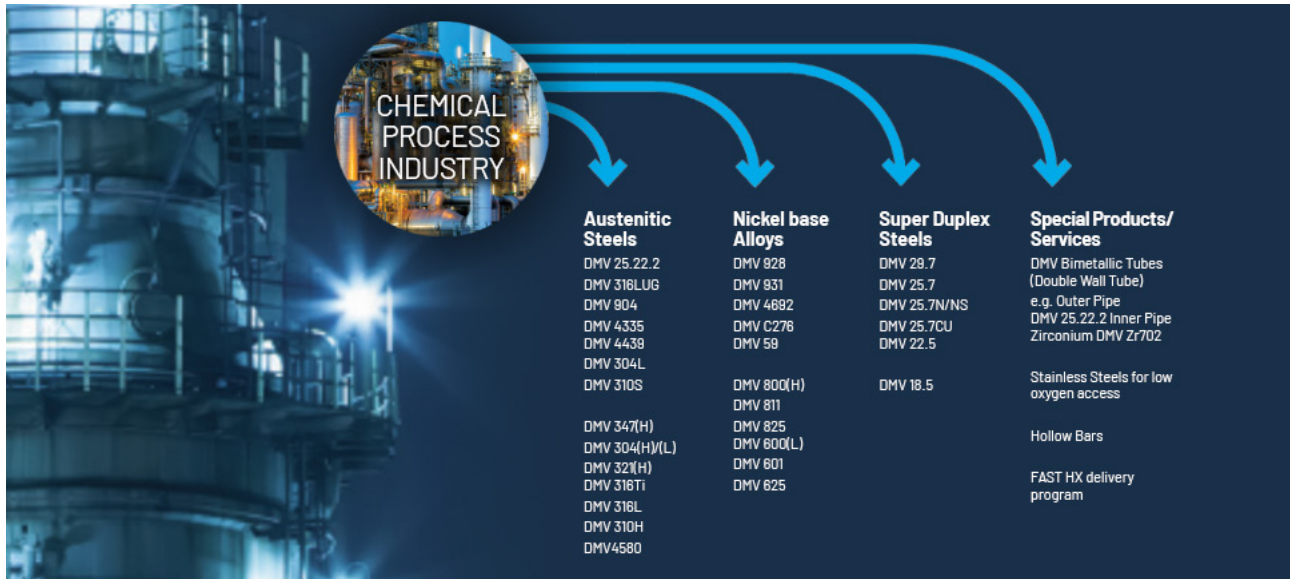


DMV 25.22.2
Bimetallic
 DMV Zr702

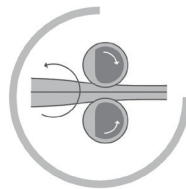
Inside DMV 702
 minimum thickness 0.7 mm
 Outside DMV 25.22.2
 minimum thickness 2 mm
 Cold Drawn



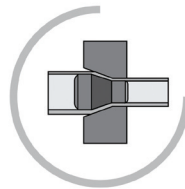
DMV grade solutions for the Chemical Process Industry



HOT EXTRUSION



COLD PILGERING



COLD DRAWING



UREA: CARBAMATE: $\text{CO}(\text{NH}_2)_2$ the basis for today's production of nitrogen release fertilizer. Urea is produced from synthetic ammonia (NH_3) and carbon dioxide CO_2 with the first step being conversion to liquid ammonium carbamate ($\text{NH}_2\text{COONH}_4$) in a reactor under pressure at 150-200 bar and 180-190°C.

Second step is conversion of the ammonium carbamate to Urea, ie:

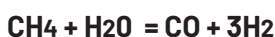


Ammonium carbamate solutions are highly corrosive in the hottest parts of the plant such as condensers, scrubbers and strippers.

Ammonium carbamate solutions are processed into condensates from the stripper with highly corrosive process environments around 180-250°C and 150 bar.

Conventional austenitic stainless steels such as 304L and 316L are unable to withstand such environments leading to the development of DMV Grades suitable for applications across the production process.

SYNGAS: (or Synthesis Gas) is a mixture of hydrogen and carbon monoxide with principle use in the production of ammonia (NH_3) or methanol (CH_3OH). Syngas is produced by steam reforming or partial oxidation of natural gas or liquid hydrocarbons.



Syngas is used a source of H_2 and in the direct reduction of iron ore to sponge iron.

NITRIC ACID (HNO_3): is used a primary reagent for the nitration process with its main industrial use being the production of fertilizers where nitric acid is neutralised with ammonia to ammonium nitrate. (NH_4NO_3).

Supporting requirements for urgent tube replacement- breakdowns, unplanned outages we offer our FAST HX product across a range of defined sizes and sizes.

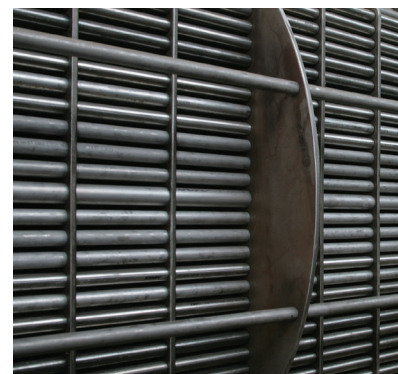
In addition, we maintain raw material stocks to support urgent requirements for Nickel alloys such as DMV C276 and DMV 625.

Contact us via your usual Sales contact or at

HX@mst.mannesmann.com

For more details visit:

www.mannesmann-stainless-tubes.com/hx/



GRADES & CAPABILITIES: FERTILIZER

Austenitic																
DMV Designation	Nearest equivalent			Typical Chemical composition						Density		Min. Mechanical Prop. at RT				
	UNS	EN	JIS	C _{max}	Cr	Ni	Mo	Cu	Others			Yield St. _{RP0.2}		Tensile St. _{Rm}		
											g/cm ³	lb/in ³	MPa	ksi	MPa	ksi
DMV 304L	S30403	1.4306 1.4435	SU 304L	0.03	19.0	11.0					7.9	0.29	170	25	485	70
DMV 316LUG	S31603	1.4361 1.4439		0.02	17.0	13.5	4.5				8.0	0.29	170	25	485	70
DMV 306SI	S30600	1.4435		0.015	18.0	15.0			Si 4		7.9	0.29	240	35	540	78
DMV 4439	(S31726)	1.4466		0.03	17.5	13.5	4.5		N 0.16		8.0	0.29	240	35	550	80
DMV 4335	S31002	1.4845		0.015	25.0	20.5			N < 0.10 %		7.9	0.29	255	37	540	78
DMV 25.22.2	S31050	1.4539		0.02	25.0	22.0	2.0		N 0.12		7.9	0.29	255	37	540	78
DMV 310S	S31008			0.015	25.0	21.0					7.9	0.29	205	30	515	75
DMV 904				0.02	20.5	25.5	4.5	1.5			8.0	0.29	215	31	490	71

Austenitic Ferritic																
DMV Designation	Nearest equivalent			Typical Chemical composition						Density		Min. Mechanical Prop. at RT				
	UNS	EN	JIS	C _{max}	Cr	Ni	Mo	Cu	Others			Yield St. _{RP0.2}		Tensile St. _{Rm}		
											g/cm ³	lb/in ³	MPa	ksi	MPa	ksi
DMV 22.5	S31803	1.4462 1.4501		0.03	22.0	5.5	3.0	0.5	N 0.17 ²⁾		7.8	0.28	450	65	620	90
DMV 25.7N	S32760	1.4410 1.4477		0.03	25.0	7.0	4.0	0.25	N 0.25; W 0.5 ²⁾		7.8	0.28	550	80	750	109
DMV 25.7NS	S32750			0.03	25.5	7.0	4.0	<0.80	N 0.3 ²⁾		7.8	0.28	550	80	750	109
DMV 29.7	S32906			0.03	29	7	2.3		N 0.35 ²⁾		7.8	0.28	650	394	800	116

Nickel and Nickel-based alloys																
DMV Designation	Nearest equivalent			Typical Chemical composition						Density		Min. Mechanical Prop. at RT				
	UNS	EN		C _{max}	Cr	Ni	Mo	Cu	Others			Yield St. _{RP0.2}		Tensile St. _{Rm}		
											g/cm ³	lb/in ³	MPa	ksi	MPa	ksi
DMV 928	N08028	1.4563 1.4562		0.02	27.0	31.0	3.5	1.2	N 0.10		8	0.29	210	31	500	73
DMV 931	N08031	2.4692 2.4605		0.015	27.0	31.0	6.5	1.2	N 0.20		8.1	0.29	280	41	650	94
DMV 4692	N08034	2.4819		0.01	27	35	6.5	1.5	N 0.20		8.1	0.29	310	45	750	108
DMV 59	N06059			0.01	23.0	59.0	16.0		Al		8.6	0.31	340	50	690	100
DMV C276	N10276			0.01	16.0	57.0	16.0		W		8.4	0.30	350	51	750	109

¹⁾ All figures in weight percentage. In case of order, the limits of the order specification will apply.

²⁾ Min PRE value controlled.

TOLERANCES

According to typical manufacturing Norms or individual customer requirements.

Outside Diameter	Hot Extruded		Cold Finished Tubes	
	D2	D2	D3	D4
EN ISO 1127 tolerance class	D2	D2	D3	D4
Permissible deviation	± 1.0% (min. ± 0.5 mm (±0.0197"))	± 1.0% (min. ± 0.5 mm (±0.0197"))	± 0.75% (min. ± 0.3 mm (±0.0012"))	± 0.5% (min. ± 0.1 mm (±0.0039"))

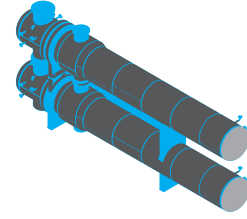
Wall Thickness	Hot Extruded		Cold Finished	
	≤ 5 mm (0.1969")	> 5 mm (0.1969")	T3	T4 (on request)
EN ISO 1127 tolerance class	T1	T2	T3	T4 (on request)
Permissible deviation	± 15.0% (min. ± 0.6 mm (±0.0236"))	± 12.5% (min. ± 0.4 mm (±0.0157"))	± 10% (min. ± 0.2 mm (±0.0074"))	± 7.5% (min. ± 0.05 mm (±0.002"))



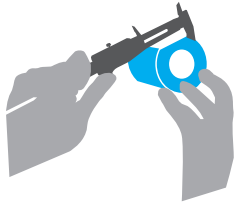
CHEMICAL INDUSTRY



FERTILIZER



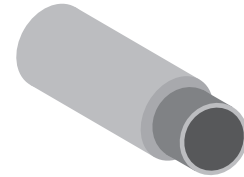
HEAT EXCHANGERS



PRECISION TUBE



DISTRIBUTION



BIMETALLIC TUBES

Quality: Zero Accident – our goal, our focus, our culture.

Across our Global manufacturing locations the health & safety of everyone on our sites is paramount. The wellbeing of employees, contractors and visitors remains our number one priority.

At Mannesmann Stainless Tubes we take pride in meeting and exceeding our Customer's Quality Expectations.

We encourage and seek feedback on our performance and from this how we may learn and continuously improve. In our most recent Customer Survey we obtained a 100% Quality Score across our Global Manufacturing plants.

We have Quality Management Systems which are approved by the world's

leading organisations such as: ASME, ISO, TUV, DNV, JIS and Lloyd's Register.

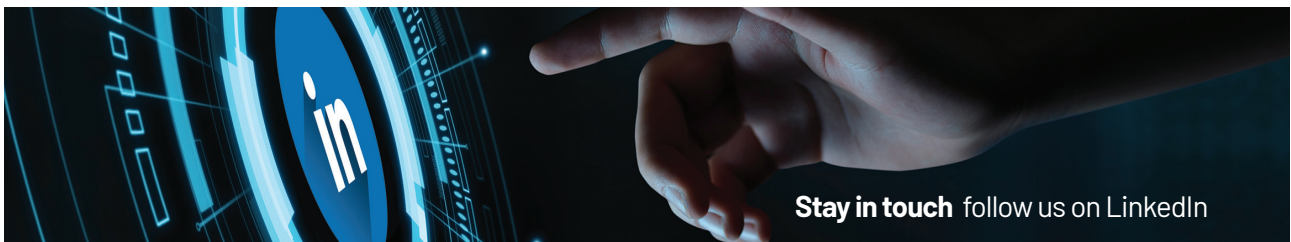
Our Customer approvals & accreditations reflect our commitment to the manufacture of the highest integrity products.



**GENUINE
QUALITY**

MST QR code system to fight fake products

All of our orders are shipped with QR code validated certificates. Expect authentic Mannesmann quality tubes only with validated QR code.



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