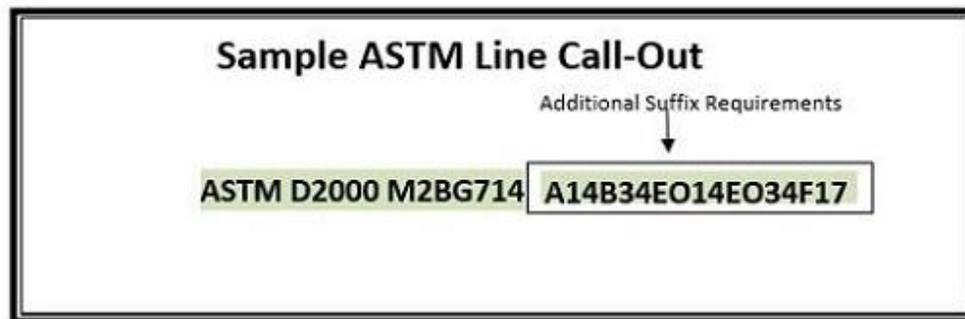


## How to Read ASTM D2000 Callout

By applying standardized line callouts to the material required, allows the flexibility of using different manufacturers' compounds — while ensuring that material quality and performance remain consistent.

Below is a standard line call-out for a Nitrile rubber compound. Each designation is defined with given tolerance levels, based on the grade.



The above call-out contains the following:

**ASTM D2000:** Document name.

**M:** The letter “M” may or may not be present – this represents the unit of measure, which is stated in SI (metric) units. If the “M” was not present, English units would be used.

**2:** Grade number. The grade number defines specific added test requirements, which are desirable in cases where the basic requirements may not ensure an acceptable material.

**BG:** Type and Class. The Type is based on changes in tensile strength. A reference chart is always given to show which polymers are used with a corresponding Type and Class.

Classification System D2000- SAE J200 Material Designation (Type and Class)	Type of Polymer Most Often Used <sup>A</sup>
AA	Natural rubber, reclaimed rubber, SBR, butyl, EP polybutadiene, polyisoprene
AK	Polysulfides
BA	Ethylene propylene, high-temperature SBR and butyl compounds
BC	Chloroprene polymers (neoprene), cm
BE	Chloroprene polymers (neoprene), cm
BF	NBR polymers
BG	NBR polymers, urethanes
BK	NBR
CA	Ethylene propylene
CE	Chlorosulfonated polyethylene (Hypalon), cm
CH	NBR polymers, epichlorohydrin polymers
DA	Ethylene propylene polymers
DE	CM, CSM
DF	Polyacrylic (butyl-acrylate type)
DH	Polyacrylic polymers, HNBR
EE	AEM
EH	ACM
EK	FZ
FC	Silicones (high strength)
FE	Silicones
FK	Fluorinated silicones
GE	Silicones
HK	Fluorinated elastomers (Viton, Fluorel, etc.)
KK	Perfluoroelastomers

<sup>A</sup> Refer to Practice D 1418.

Type is based on change in tensile strength after heat aging for 70 hours at a given temperature, stated below:

Type	Test Temperature, °C
A	70
B	100
C	125
D	150
E	175
F	200
G	225
H	250
J	275
K	300

Class is based on the resistance of the material to ASTM Oil IRM903 after a 70-hour immersion. Below shows volume swell by class:

Class	Volume Swell, max, %
A	no requirement
B	140
C	120
D	100
E	80
F	60
G	40
H	30
J	20
K	10

**7:** The next digit, 7, specifies the hardness of the material – in this case, Shore A durometer. For standard physical properties, hardness is taken at  $\pm 5$ .

**14:** This digit indicates the tensile strength – for example, 14 for 14MPa. These values are typically based on what standard polymers are actually used in the industry. Remember, this will be in SI units if the letter “M” is present in the call-out. To convert to psi, simply multiply the MPa number by 145.

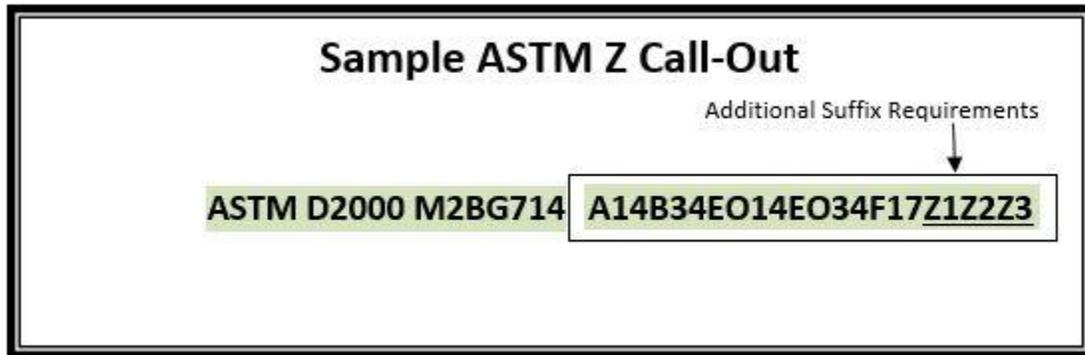
### **Additional suffix requirements: A14B34E014E034F17**

Suffix Letter	Test Required
A	Heat Resistance
B	Compression Set
C	Ozone or Weather Resistance
D	Compression-Deflection Resistance
EA	Fluid Resistance (Aqueous)
EF	Fluid Resistance (Fuels)
EO	Fluid Resistance (Oils and Lubricants)
F	Low-Temperature Resistance
G	Tear Resistance
H	Flex Resistance
J	Abrasion Resistance
K	Adhesion
M	Flammability Resistance
N	Impact Resistance
P	Staining Resistance
R	Resilience
Z	Any special requirement, which shall be specified in detail

A14B34E014E034F17 is the second half of the original sample ASTM line call-out.

The additional suffix requirements, or “alphabet soup” as it is known, is added to create a “custom” compound engineered specifically for the part application.

## Special Requirements for ASTM D2000



Special requirements can be added using a “Z” call-out. This is typically done after the last call-out and number. These call outs are customer specific, not an industry standard.

This is just a general overview, the callout should be discussed with your material manufacturer to verify compliance.