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# Advanced Core Materials

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<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
AC TC		81	9/6/2018
AC 1100		18	9/6/2018
AC 1101		8	6/10/2016
AC 1102		8	7/12/2017
AC 1103		10	8/17/2016
AC 1104		11	11/15/2013
AC 1106		8	7/5/2018
AC 1107		7	1/6/2015
AC 1108		11	3/3/2015
AC 1109		16	2/21/2014
AC 1111		4	2/25/2011
AC 1113		5	8/17/2016
AC 1114		3	10/17/2000
AC 1123		2	12/20/1991
AC 1125		7	4/27/2010
AC 1131		2	12/20/1991
AC 1134		2	12/20/1991
AC 1137		4	12/2/2011
AC 1138		2	1/6/2015
AC 1139		7	9/25/2015
AC 1141		Original	8/18/2010
AC 1142		Original	3/24/2016

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.  
 Ø - Denotes change from previous issue.

# Coating

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## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CD TC		170	4/26/2019
CD 1004		8	4/3/2000
CD 1007		8	11/22/2004
CD 1008		Original	3/28/2008
CD 1009		1	10/11/2018
CD 1011		11	11/10/2010
CD 1013		11	4/1/2019
CD 1014		8	4/1/2019
CD 1015		5	7/17/1996
CD 1016		8	6/28/2011
CD 1017		5	7/16/1996
CD 1021		6	7/16/1996
CD 1028		6	6/28/2017
CD 1029		10	10/18/2013
CD 1032		18	4/24/2007
CD 1039A		Original	10/22/1996
CD 1039B		1	5/20/2009
CD 1039C		Original	10/22/1996
CD 1042A		7	5/13/2016
CD 1042B		5	7/7/1997
CD 1045		13	4/26/2019
CD 1046		6	11/5/2013
CD 1047		5	7/7/1997
CD 1048		6	12/23/1996
CD 1049		7	10/18/2013
CD 1052		5	8/26/1996
CD 1056		3	1/27/1997
CD 1057		12	4/4/2016
CD 1058		12	6/30/1998
CD 1059		11	7/18/2017
CD 1061		7	2/14/2011
CD 1062		11	9/10/2015
CD 1067		5	8/26/1996
CD 1068		5	1/27/1997
CD 1073		8	10/15/2003
CD 1074		5	12/11/2000
CD 1075		4	11/27/2000

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Ø - Denotes change from previous issue.

# Coating

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CD 1077		5	4/11/1997
CD 1078		5	7/7/1997
CD 1079		4	8/26/1996
CD 1081		6	1/27/1997
CD 1084		9	11/10/2010
CD 1085		5	4/11/1997
CD 1086		8	8/5/2010
CD 1088		5	10/22/1996
CD 1089		5	9/8/1998
CD 1090		8	3/1/2002
CD 1098		7	11/27/2000
CD 1100A		2	5/13/2016
CD 1100B		2	5/13/2016
CD 1100C		2	5/13/2016
CD 1102		Original	3/3/1999
CD 1112		3	3/3/1999
CD 1115		10	5/13/2016
CD 1117		6	10/23/2006
CD 1122		8	5/13/2016
CD 1124		2	8/3/2017
CD 1125		6	10/23/2006
CD 1129		5	10/22/1996
CD 1132		2	8/10/1993
CD 1133		10	6/19/2013
CD 1134		9	9/13/2016
CD 1135		3	11/27/2000
CD 1137		8	4/21/2017
CD 1138		3	11/27/2000
CD 1140		10	10/18/2013
CD 1142		6	7/5/2007
CD 1145		3	8/23/2004
CD 1146		3	11/27/2000
CD 1148		1	5/24/2007
CD 1147		8	8/1/2016
CD 1149		4	8/16/1999
CD 1155		2	11/27/2000
CD 1158		2	11/27/2000

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# Coating

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## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CD 1160		10	11/4/2014
CD 1161		4	6/28/2011
CD 1162		4	6/28/2011
CD 1163		5	2/22/2016
CD 1174		1	11/27/2000
CD 1175		1	11/27/2000
CD 1176		1	11/27/2000
CD 1177		1	8/20/1996
CD 1178		1	8/22/1996
CD 1180		1	7/16/1996
CD 1182		3	4/26/2013
CD 1184		9	5/16/2006
CD 1185		3	6/28/2011
CD 1186		1	11/27/2000
CD 1187		3	11/2/2000
CD 1188		1	9/8/1995
CD 1189		1	9/8/1995
CD 1191		1	9/8/1995
CD 1193		3	8/16/2007
CD 1194		4	11/5/2013
CD 1195		1	10/4/1995
CD 1196		2	12/18/2008
CD 1197		2	7/25/1997
CD 1198		2	11/9/2001
CD 1199		7	5/8/2007
CD 1200		1	7/1/2014
CD 1201		2	7/1/2014
CD 1202		2	7/17/2014
CD 1203		2	7/1/2014
CD 1205		1	7/1/2014
CD 1206		Original	5/27/1998
CD 1207		1	7/1/2014
CD 1208		1	11/5/2013
CD 1210		3	7/1/2014
CD 1211		1	7/17/2014
CD 1212		1	11/5/2013
CD 1213		1	7/17/2014

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Ø - Denotes change from previous issue.

# Coating

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## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CD 1214		2	7/1/2014
CD 1215		2	7/1/2014
CD 1217		6	4/4/2016
CD 1218		3	11/5/2013
CD 1220		6	4/4/2016
CD 1221		4	8/12/2014
CD 1222		1	7/1/2014
CD 1225		3	5/3/2018
CD 1226		1	7/17/2014
CD 1227		1	7/17/2014
CD 1228		2	7/17/2014
CD 1229		2	7/17/2014
CD 1230		4	8/1/2016
CD 1231		4	7/17/2014
CD 1233		5	7/17/2014
CD 1234		5	8/1/2016
CD 1235		2	7/22/2014
CD 1236		2	7/16/2018
CD 1237		1	7/22/2014
CD 1238		2	7/22/2014
CD 1239		1	7/22/2014
CD 1240		2	7/22/2014
CD 1241		1	7/22/2014
CD 1242		3	7/22/2014
CD 1243		1	7/22/2014
CD 1244		2	7/22/2014
CD 1245		3	7/10/2018
CD 1246		1	8/12/2014
CD 1247		2	6/10/2014
CD 1248		1	8/12/2014
CD 1249		3	8/12/2014
CD 1250		2	8/12/2014
CD 1251		1	8/12/2014
CD 1252		3	8/12/2014
CD 1253		2	8/12/2014
CD 1254		1	8/12/2014
CD 1255		1	8/12/2014

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Ø - Denotes change from previous issue.

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## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CD 1256		1	8/12/2014
CD 1257		1	9/20/2014
CD 1258		3	9/20/2014
CD 1259		1	9/20/2014
CD 1260		2	9/20/2014
CD 1261		1	9/20/2014
CD 1262		1	9/20/2014
CD 1263		1	9/20/2014
CD 1264		1	9/20/2014
CD 1265		1	9/20/2014
CD 1266		1	9/20/2014
CD 1267		1	9/20/2014
CD 1268		Original	12/12/2003
CD 1269		1	1/22/2013
CD 1270		2	9/20/2014
CD 1271		1	12/15/2011
CD 1272		2	9/20/2014
CD 1273		1	11/5/2013
CD 1274		3	12/15/2011
CD 1275		1	9/20/2014
CD 1276		Original	2/18/2004
CD 1277		1	9/20/2014
CD 1278		1	9/20/2014
CD 1279		2	6/10/2014
CD 1280		1	10/8/2014
CD 1281		1	10/7/2014
CD 1282		1	10/7/2014
CD 1283		5	8/1/2016
CD 1284		4	10/7/2014
CD 1285		1	10/7/2014
CD 1286		1	10/7/2014
CD 1287		2	10/7/2014
CD 1288		1	10/7/2014
CD 1289		1	10/7/2014
CD 1290		1	10/7/2014
CD 1291		1	10/7/2014
CD 1292		2	8/1/2016

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Ø - Denotes change from previous issue.

# Coating

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## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CD 1293		1	10/7/2014
CD 1294		1	10/7/2014
CD 1295		2	10/7/2014
CD 1296		6	8/1/2016
CD 1297		1	10/7/2014
CD 1299		1	1/4/2012
CD 1300		Original	12/11/2009
CD 1301		1	8/12/2014
CD 1302		2	3/16/2018
CD 1303		1	8/12/2014
CD 1304		Original	2/14/2012
CD 1305		Original	4/25/2012
CD 1306		2	1/11/2017
CD 1307		Original	8/27/2018
CD 1308		Original	6/10/2014
CD 1309		Original	6/30/2015
CD 1310		Original	10/11/2018

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Ø - Denotes change from previous issue.



# Cleaning

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CM TC		55	4/2/2019
CM 1011		6	4/2/2019
CM 1012A		6	2/15/2019
CM 1012B		6	1/6/2011
CM 1012C		4	2/15/2019
CM 1012D		Original	11/7/2018
CM 1013		8	8/3/2017
CM 1013A		Original	10/19/2017
CM 1014		4	8/2/2011
CM 1016		6	12/13/2014
CM 1017		10	11/9/2010
CM 1017R		7	11/9/2010
CM 1018		7	2/6/2004
CM 1018R		5	2/6/2004
CM 1021		8	11/9/2010
CM 1021R		6	11/9/2010
CM 1023A		10	6/14/2018
CM 1023B		11	6/14/2018
CM 1023C		10	6/14/2018
CM 1023D		10	6/14/2018
CM 1023E		10	6/14/2018
CM 1023F		1	2/15/2019
CM 1024		9	11/9/2010
CM 1028		9	2/6/2004
CM 1029		10	11/9/2010
CM 1029R		5	11/9/2010
CM 1030		6	2/6/2004
CM 1031		10	11/9/2010
CM 1031R		5	11/9/2010
CM 1032		3	4/15/2004
CM 1033		3	4/15/2004
CM 1034		3	4/15/2004
CM 1035		2	9/8/2003
CM 1037		4	4/21/2009

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Ø - Denotes change from previous issue.

# Core Materials

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<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CP TC		155	4/26/2019
CP 1000		5	2/7/2017
CP 1001		1	1/9/2004
CP 1002		2	1/9/2004
CP 1006		4	7/17/2006
CP 1007		2	5/25/2016
CP 1008		2	8/9/2011
CP 1009		1	8/20/2007
CP 1014		Original	11/9/2006
CP 1015		Original	3/18/2002
CP 1016		1	6/14/2011
CP 1017		6	6/28/2017
CP 1019		2	9/22/2005
CP 1020		1	4/30/2004
CP 1021		1	4/2/2004
CP 1022		2	9/21/2015
CP 1024		2	8/21/2007
CP 1025		1	8/28/2012
CP 1026		1	1/24/2012
CP 1027		6	11/29/2017
CP 1029		Original	4/26/2019
CP 1030		Original	5/13/2010
CP 1031		Original	5/13/2010
CP 1033		Original	4/30/2012
CP 1035		Original	12/4/2015
CP 1036		4	3/28/2019
CP 1040		1	4/4/2016
CP 1097		Original	5/21/2018
CP 1104		13	8/28/2012
CP 1105		7	4/11/2008
CP 1118		9	6/26/2008
CP 1121		4	6/6/2007
CP 1129		19	5/23/2017
CP 1130		19	1/5/2012
CP 1131		15	7/30/2018
CP 1132		17	7/30/2018
CP 1137		11	6/6/2013

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Ø - Denotes change from previous issue.

# Core Materials

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<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
CP 1138		24	11/29/2017
CP 1140		18	1/11/2018
CP 1141		11	8/24/2010
CP 1142		10	2/28/2011
CP 1143		4	4/18/2007
CP 1145		3	2/28/2011
CP 1147		5	6/19/2007
CP 1148		4	1/11/2018
CP 1150		10	7/30/2018
CP 1153		8	1/11/2018
CP 1154		13	6/15/2018
CP 1156		16	2/1/2014
CP 1157		10	7/16/2014
CP 1160		5	2/28/2012
CP 1162		12	6/15/2018
CP 1164		9	1/11/2018
CP 1165		10	1/11/2018
CP 1168		18	8/27/2018
CP 1171		12	7/30/2018
CP 1174		4	10/20/2003
CP 1176		8	2/28/2011
CP 1177		7	1/26/2013
CP 1182		7	8/7/2013
CP 1183		10	12/8/2016
CP 1199		2	5/23/2006

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
DS TC		32	6/8/2017
DS 1000		9	5/21/2007
DS 1001		8	8/25/2005
DS 1002		5	8/25/2005
DS 1003		7	2/9/2015
DS 1003A		2	2/9/2015
DS 1004		10	1/19/2009
DS 1005A		6	1/19/2009
DS 1005B		7	6/8/2017
DS 1006		8	1/15/2010
DS 1007		4	8/25/2005
DS 1008		6	1/15/2010
DS 1009		4	8/25/2005
DS 1010		2	8/25/2005

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 Ø - Denotes change from previous issue.

# Crucible

5/15/2019

## Raw Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
MC TC		98	10/29/2018
MC 1001		18	3/7/2014
MC 1001B		2	3/7/2014
MC 1002		18	3/7/2014
MC 1002B		1	3/7/2014
MC 1004		23	8/27/2018
MC 1005		13	10/29/2018
MC 1006		10	10/15/2008
MC 1012		5	10/29/2018
MC 1014		11	5/1/2014
MC 1015		14	5/1/2014
MC 1016		12	5/1/2014
MC 1017		18	5/1/2014
MC 1017B		1	5/1/2014
MC 1018		4	4/23/2016
MC 1018B		Original	10/10/2013
MC 1021		6	2/10/2000
MC 1023		14	5/1/2014
MC 1024		14	5/1/2014
MC 1025		15	5/1/2014
MC 1030		7	5/1/2014
MC 1032		3	5/1/2014
MC 1033		19	4/23/2016
MC 1035		2	2/23/2018
MC 1038		1	5/8/2014
MC 1041		3	3/7/2014
MC 1040		3	1/17/2014
MC 1042		4	11/28/2006

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Mono-Shell

## Raw Materials

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<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
MS TC		183	2/12/2019
MS 1001A		13	7/9/2012
MS 1002A		17	8/2/2018
MS 1004		3	4/5/2017
MS 1005		8	2/24/2014
MS 1005A		1	2/16/2016
MS 1005B		Original	2/24/2014
MS 1005C		2	1/30/2018
MS 1008B		7	9/13/2013
MS 1008C		Original	5/30/2014
MS 1010A		7	1/16/2014
MS 1010B		9	1/16/2014
MS 1010C		7	1/16/2014
MS 1010D		9	1/16/2014
MS 1010N		2	6/22/2017
MS 1010J		2	6/22/2017
MS 1010M		3	6/22/2017
MS 1010K		2	6/22/2017
MS 1010L		2	6/22/2017
MS 1012A		31	8/28/2018
MS 1012B		18	7/30/2010
MS 1012C		18	1/4/2018
MS 1012D		16	12/20/2017
MS 1012G		6	6/11/2008
MS 1012J		3	11/11/2016
MS 1012K		Original	8/28/2018
MS 1013		3	4/5/2017
MS 1017		6	6/19/2013
MS 1018		4	4/5/2017
MS 1019		3	4/5/2017
MS 1019B		Original	11/24/2010
MS 1020C		5	11/14/2013
MS 1021A		6	6/11/2018
MS 1021B		9	6/11/2018
MS 1024		3	4/5/2017
MS 1028		3	4/5/2017
MS 1031		2	3/30/2001

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Ø - Denotes change from previous issue.

# Mono-Shell

## Raw Materials

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<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
MS 1032		5	6/15/2017
MS 1036		5	4/5/2017
MS 1037		3	11/5/2001
MS 1040		8	7/24/2009
MS 1041		16	1/23/2016
MS 1042		12	1/30/2018
MS 1046		6	8/28/2018
MS 1053		6	9/7/2017
MS 1058		5	4/13/2017
MS 1060		13	1/23/2016
MS 1063		13	2/16/2016
MS 1063T		2	2/16/2016
MS 1064		19	8/2/2018
MS 1064R		1	12/2/2014
MS 1064R75		1	2/12/2019
MS 1064R88		Original	2/23/2015
MS 1065		8	5/2/2008
MS 1066		3	4/13/2017
MS 1067		4	2/16/2016
MS 1068		4	5/4/2018
MS 1068A		1	4/13/2017
MS 1068B		1	4/13/2017
MS 1068C		2	6/19/2013
MS 1069		11	3/14/2013
MS 1069RFQ		3	3/14/2013
MS 1069T		1	12/4/2013
MS 1070C		11	6/15/2017
MS 1071		7	1/30/2018
MS 1072		3	1/30/2018
MS 1073		1	3/1/1995
MS 1075		6	11/11/2016
MS 1077		Original	1/7/2000
MS 1078		1	7/30/2010
MS 1079		2	10/31/2002
MS 1080		1	1/9/2004
MS 1081		Original	3/30/2001
MS 1082		2	2/7/2017

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Ø - Denotes change from previous issue.

# Mono-Shell

## Raw Materials

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<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
MS 1082A		Original	8/30/2016
MS 1083		1	6/15/2016
MS 1084		2	4/8/2009
MS 1085		1	12/10/2015
MS 1086		Original	3/30/2001
MS 1087		2	6/29/2015
MS 1088		Original	11/2/2001
MS 1089		5	2/16/2016
MS 1089A		4	2/16/2016
MS 1090		6	8/28/2018
MS 1091		Original	1/29/2008
MS 1092A		Original	1/6/2012
MS 1092B		1	6/19/2013
MS 1092C		2	7/24/2015
MS 1093		4	4/12/2016
MS 1094		Original	4/25/2013
MS 1095A		Original	11/5/2015
MS 1095B		Original	11/5/2015
MS 1095C		Original	11/5/2015
MS 1095D		Original	11/5/2015
MS 1096		1	1/30/2018

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Ø - Denotes change from previous issue.



# Process Materials

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
PM TC		179	5/7/2019
PM 100		5	10/27/2017
PM 100A		2	2/8/2019
PM 100C		1	7/17/2009
PM 101A		20	12/20/2018
PM 101C		8	12/11/2013
PM 102		6	7/17/2009
PM 102C		3	2/8/2019
PM 103		2	2/8/2019
PM 104A		Original	12/5/2003
PM 105		17	5/25/2016
PM 105N		Original	12/17/2015
PM 105RFQ		1	5/25/2016
PM 106A		7	10/27/2017
PM 106B		9	10/27/2017
PM 106C		9	10/27/2017
PM 106D		7	5/23/2017
PM 106F		6	12/22/2016
PM 106G		8	10/11/2017
PM 106H		8	11/4/2011
PM 106I		6	1/29/2018
PM 106J		8	1/29/2018
PM 106K		4	1/29/2018
PM 106L		2	1/29/2018
PM 106M		1	5/23/2017
PM 107		7	4/6/2015
PM 107B		Original	7/17/2009
PM 107B-RFQ		Original	12/22/2016
PM 108		9	4/23/2019
PM 108A		Original	5/15/2009
PM 111		4	2/21/2019
PM 112		5	6/15/2017
PM 112A		1	6/15/2017
PM 114A		15	1/22/2016
PM 114B		15	1/22/2016
PM 114C		1	2/22/2016
PM 114D		1	2/22/2016

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Process Materials

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
PM 115		7	7/14/2015
PM 115A		1	1/22/2016
PM 115RFQ		Original	3/9/2010
PM 116A		5	6/12/2017
PM 116B		3	3/31/2003
PM 116C		3	3/31/2003
PM 116D		4	3/31/2003
PM 116E		3	3/31/2003
PM 116G		4	2/28/2018
PM 116H		3	3/31/2003
PM 116J		3	3/31/2003
PM 116K		3	3/31/2003
PM 117		5	12/22/2016
PM 117B		Original	8/24/2010
PM 117A		1	2/8/2019
PM 118		6	2/8/2019
PM 119		11	12/20/2018
PM 119A		7	12/20/2018
PM 119B		Original	5/23/2017
PM 119C		Original	8/15/2018
PM 123DS		1	2/10/2015
PM 123EQ		1	12/20/2018
PM 123HEC		1	12/20/2018
PM 124		7	10/10/2016
PM 124A		6	2/26/2010
PM 124B		3	2/21/2019
PM 124C		5	7/24/2015
PM 124D		Original	7/14/2015
PM 124E		Original	7/14/2015
PM 124F		Original	7/14/2015
PM 124G		Original	1/22/2016
PM 124H		Original	1/22/2016
PM 124J		Original	1/22/2016
PM 124K		1	1/22/2016
PM 124L		1	1/22/2016
PM 126		3	2/21/2019
PM 127A		5	12/17/2015

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Process Materials

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
PM 127B		5	12/17/2015
PM 127C		5	12/17/2015
PM 128A		8	3/11/2015
PM 128B		9	3/11/2015
PM 128C		4	7/17/2014
PM 129		3	2/8/2019
PM 130		3	2/8/2019
PM 131		5	11/20/2013
PM 131A		2	2/21/2019
PM 132A		6	4/23/2019
PM 132B		6	4/23/2019
PM 133		3	2/8/2019
PM 134		3	2/21/2019
PM 135		3	8/5/2003
PM 136		6	12/20/2018
PM 137		3	2/8/2019
PM 138		5	8/7/2009
PM 139		5	8/7/2009
PM 140		5	8/7/2009
PM 141		5	4/6/2015
PM 142		5	12/20/2018
PM 142A		3	3/28/2019
PM 142A.01		Original	3/28/2019
PM 144		3	7/17/2009
PM 145		4	2/9/2017
PM 146		2	11/6/2009
PM 146A		2	9/5/2017
PM 147		2	2/21/2019
PM 147A		Original	11/20/2013
PM 148		1	5/19/2004
PM 151		2	4/4/2018
PM 152		2	2/21/2019
PM 153		Original	9/9/2014
PM 154		1	4/23/2019
PM 201		6	1/29/2018
PM 202		3	2/21/2019
PM 203		4	3/16/2018

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Process Materials

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
PM 204		3	3/25/2017
PM 205		6	2/21/2019
PM 206		3	2/8/2019
PM 207		5	12/20/2018
PM 208		3	3/12/2012
PM 208A		Original	5/7/2019
PM 209		4	8/17/2009
PM 211		6	2/21/2019
PM 301		7	4/23/2019
PM 301.01		Original	7/5/2018
PM 301A		Original	7/5/2018
PM 301A.01		Original	7/5/2018
PM 302		2	7/22/2003
PM 303		8	4/23/2019
PM 303B		Original	4/23/2019

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Shell Room

## Raw Materials

5/15/2019

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
SR TC		28	7/26/2018
SR 1001		5	5/7/2012
SR 1002		3	6/30/2015
SR 1002B		1	5/7/2012
SR 1003		Original	11/16/1999
SR 1004		1	5/21/2001
SR 1004A		2	6/30/2015
SR 1005		1	11/16/1999
SR 1006		3	10/8/2013
SR 1007		4	5/7/2012
SR 1010		Original	11/16/1999
SR 1011		Original	1/31/2000
SR 1012		3	5/7/2012
SR 1013		1	5/7/2012
SR 1014		4	5/7/2012
SR 1015		4	5/7/2012
SR 1016		2	5/7/2012
SR 1017		1	5/20/2002
SR 1018		6	7/26/2018
SR 1018B		1	5/7/2012
SR 1019		4	5/7/2012
SR 1019A		Original	1/21/2016
SR 1019B		1	5/7/2012
SR 1020		2	5/7/2012
SR 1020B		1	5/7/2012
SR 1021		3	5/7/2012
SR 1021A		Original	1/21/2016
SR 1022		1	5/7/2012
SR 1023		Original	9/29/2015
SR 1024		Original	9/29/2015
SR 1025		Original	1/21/2016
SR 1026		Original	1/21/2016

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Test Bar

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
TBM TC		42	5/1/2019
TBM 1010		9	8/13/2018
TBM 1020		21	4/3/2019
TBM 1020.01		1	3/1/2019
TBM 1020.02		Original	8/13/2018
TBM 002		3	4/23/2007
TBM 011		3	4/23/2007
TBM 014		3	4/23/2007
TBM 018		3	4/23/2007
TBM 020		2	4/23/2007
TBM 025		3	4/23/2007
TBM 193		3	4/23/2007
TBM 195		3	4/23/2007
TBM 1000		5	11/17/2009
TBM 1106		4	11/17/2009
TBM 1400		4	11/17/2009
TBM 2020		3	4/23/2007
TBM 2100		3	4/23/2007
TBM 2120		3	4/23/2007
TBM 2300		3	4/23/2007
TBM 2500		2	4/23/2007
TBM 3004		5	3/1/2019
TBM 3030		4	3/1/2019
TBM 3031		1	3/1/2019
TBM 3032		Original	3/1/2019
TBM 3040		4	3/1/2019
TBM 3104		3	4/23/2007
TBM 3110		3	4/23/2007
TBM 3120		3	4/23/2007
TBM 3200		2	4/23/2007
TBM 3300		3	4/23/2007
TBM 3310		3	4/23/2007
TBM 4000		4	3/1/2019
TBM 4004		6	3/1/2019
TBM 4005		1	3/1/2019
TBM 4006		Original	7/20/2010
TBM 4008		Original	3/1/2019

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Test Bar

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
TBM 4009		Original	3/1/2019
TBM 4020		3	3/1/2019
TBM 4030		4	3/1/2019
TBM 4031		4	3/1/2019
TBM 4032		Original	3/1/2019
TBM 4049		3	10/10/2016
TBM 4050		4	3/1/2019
TBM 4051		3	3/1/2019
TBM 4052		1	5/1/2019
TBM 4058		Original	3/1/2019
TBM 4200		8	3/1/2019
TBM 4300		3	3/1/2019
TBM 5262		4	4/23/2007
TBM 5270		3	4/23/2007
TBM 5275		3	4/23/2007
TBM 5291		4	4/23/2007
TBM 6010		5	3/1/2019
TBM 6050		3	4/23/2007
TBM 6060		3	4/23/2007
TBM 6070		3	4/23/2007
TBM 6095		6	10/29/2007
TBM 6115		4	4/23/2007
TBM 6120		7	4/23/2007
TBM 6130		2	4/23/2007
TBM 7000		3	4/23/2007
TBM 7001		1	4/23/2007
TBM 7005		3	4/23/2007
TBM 7010		4	3/1/2019
TBM 7020		3	4/23/2007
TBM 7030		3	4/23/2007
TBM 8020		2	5/9/2012
TBM A1		3	4/23/2007
TBM A2		1	4/23/2007
TBM A8		4	5/9/2012
TBM A9		4	5/9/2012
TBM A10		4	5/9/2012
TBM A11		2	4/23/2007

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Wax

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
WM TC		137	3/29/2019
WM 5004		10	4/18/2018
WM 5004A		2	4/18/2018
WM 5022		Original	12/22/2015
WM 5024		2	4/1/2009
WM 5024A		Original	11/17/2006
WM 5024R		1	5/26/2016
WM 5027		15	3/24/2018
WM 5027A-C		Original	3/24/2018
WM 5027A		16	3/24/2018
WM 5027S		13	11/30/2015
WM 5028		14	3/24/2018
WM 5028B		5	4/18/2018
WM 5029		3	1/31/2018
WM 5029A		3	1/31/2018
WM 5029B		Original	1/27/2015
WM 5032		6	1/10/2007
WM 5035		14	3/24/2018
WM 5038		16	3/24/2018
WM 5038C		2	4/18/2018
WM 5040		14	3/24/2018
WM 5042		15	3/24/2018
WM 5045		9	4/18/2018
WM 5046		9	4/18/2018
WM 5054		5	6/26/2014
WM 5058		5	7/20/2018
WM 5059		Original	5/25/2012
WM 5060		2	5/2/2014
WM 5060C		Original	7/30/2015
WM 5061		11	6/23/2017
WM 5062A		2	12/22/2015
WM 5062B		2	10/23/2014
WM 5064		10	4/18/2018
WM 5065		11	6/23/2017
WM 5065R1		2	12/22/2015
WM 5066		13	3/24/2018
WM 5067		11	10/23/2014

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.



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5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
WM 5070		11	4/18/2018
WM 5070A		1	4/18/2018
WM 5075		10	6/30/2017
WM 5080		10	7/13/2017
WM 5081		10	4/18/2018
WM 5083		9	10/23/2014
WM 5084		8	4/18/2018
WM 5085		10	6/30/2017
WM 5086		6	11/17/2006
WM 5088		8	3/12/2014
WM 5090		7	10/23/2014
WM 5091		2	4/18/2018
WM 5093		5	4/18/2018
WM 5094		7	3/29/2019
WM 5095		11	4/18/2018
WM 5096		6	3/24/2018
WM 5097		7	3/24/2018
WM 5097C		Original	10/9/2017
WM 5100		10	4/18/2018
WM 5102		4	4/18/2018
WM 5106		7	4/18/2018
WM 5107		4	9/13/2007
WM 5108		6	4/18/2018
WM 5114		5	12/22/2014
WM 5116		6	4/20/2009
WM 5122		5	4/1/2009
WM 5125		4	1/27/2015
WM 5150		9	4/18/2018
WM 5152		4	4/18/2018
WM 5202		2	5/15/2009
WM 5210		2	6/24/2010
WM 5203		1	5/15/2009
WM 5211		1	7/1/2010
WM 5211.01		Original	6/24/2010
WM 5211.02		Original	6/24/2010
WM 5211.03		Original	6/24/2010
WM 5211.04		Original	6/24/2010

\* Refer to the Alcoa Howmet purchase order for the DESCRIPTION of the applicable specification.

Ø - Denotes change from previous issue.

# Wax

5/15/2019

## Material Specifications

<u>Spec Number</u>	<u>* Description</u>	<u>Revision Number</u>	<u>Revision Date</u>
WM 5211.05		Original	6/24/2010
WM 5211.06		Original	6/24/2010
WM 5211.07		1	7/26/2011
WM 5211.08		Original	7/1/2010
WM 5280		Original	1/21/2011
WM TC		110	7/27/2018
WM 7033		9	5/26/2016
WM 7063		7	1/29/2003
WM 7065B		2	1/7/2015
WM 7115		5	11/6/2007

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Ø - Denotes change from previous issue.