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SESSION 2018

CONCOURS GÉNÉRAL DES MÉTIERS

PLASTIQUES ET COMPOSITES

Dossier Ressources

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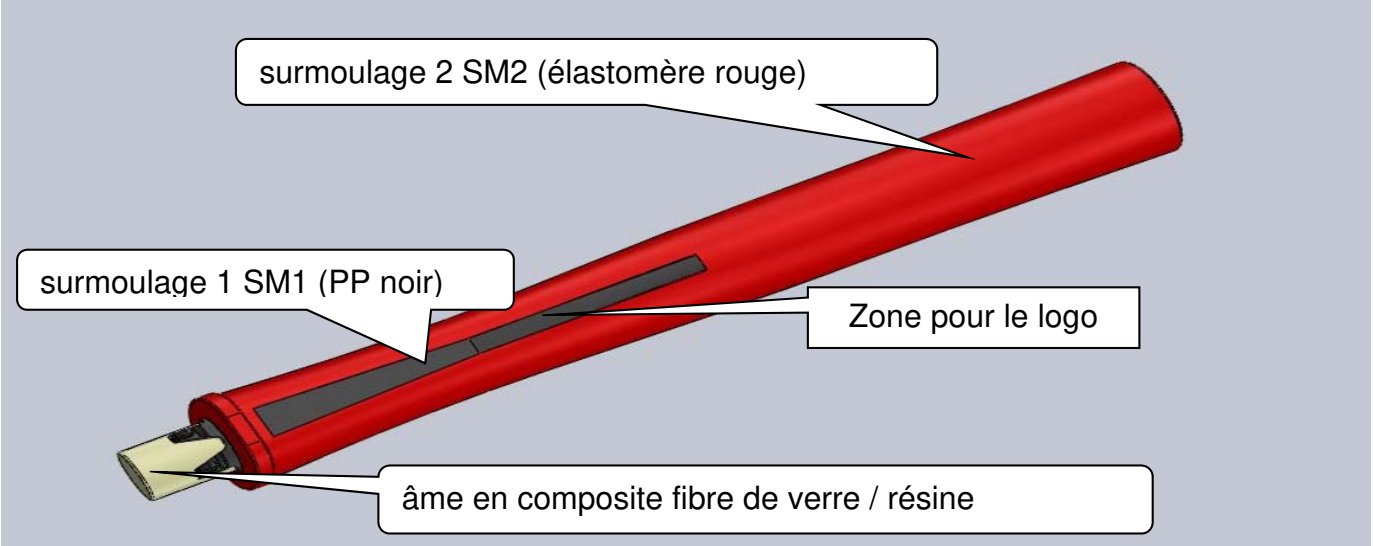
Présentation de l'entreprise

La société « Moulage Technique du Sud Ouest » exerce son activité dans l'injection des matières plastiques. Elle est tout particulièrement spécialisée dans la bi-injection et le surmoulage de pièces techniques.

L'entreprise emploie 80 salariés, répartis sur cinq ateliers (décoration / injection / assemblage / outillage / maintenance). Elle exploite un parc de 7 presses à injecter horizontales et 10 presses d'injection verticales.

Présentation du produit

La production choisie est celle d'un manche de marteau ergonomique fabriqué pour un fournisseur multimarque.
Le manche est fabriqué en trois parties :



Un bloc porte empreinte interchangeable, placé dans le moule, permet d'apposer différents logos sur le manche selon les clients.

L'entreprise doit répondre à une demande de 25 000 manches par mois pendant 5 ans.

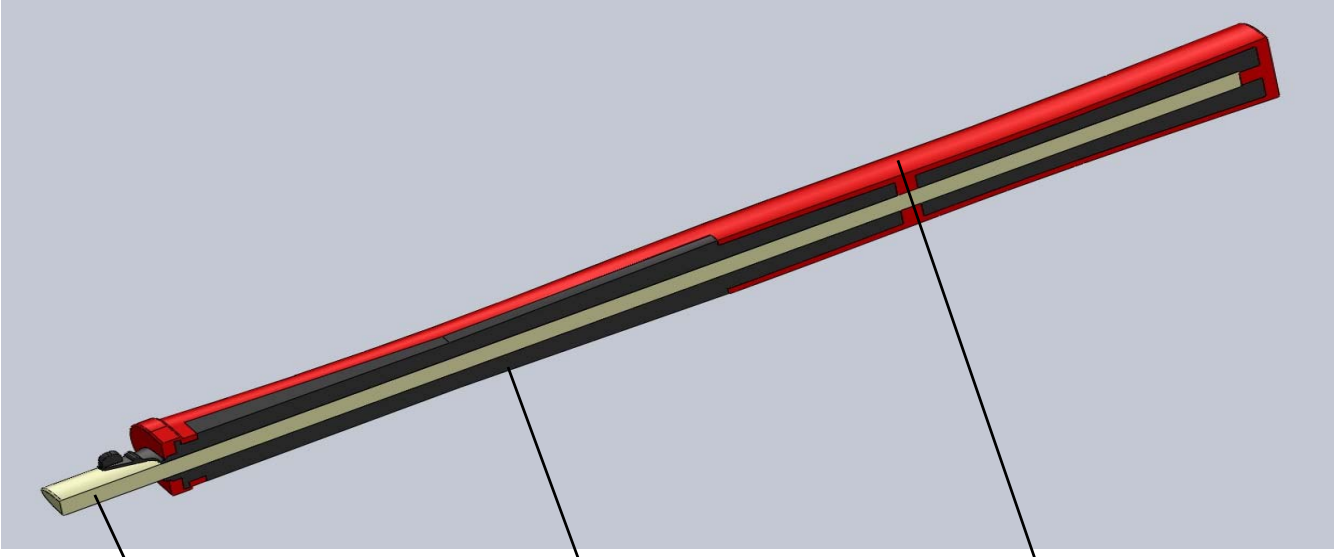
Elle fonctionne en 2 équipes, 5 jours sur 7 :

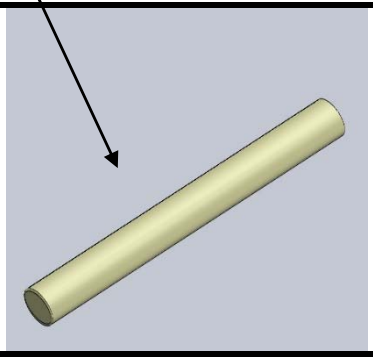
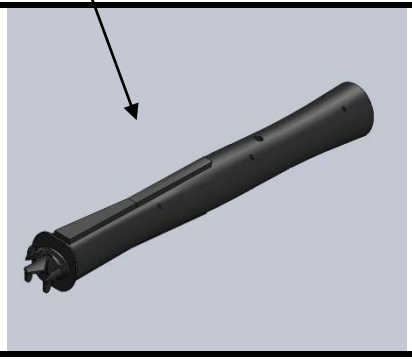
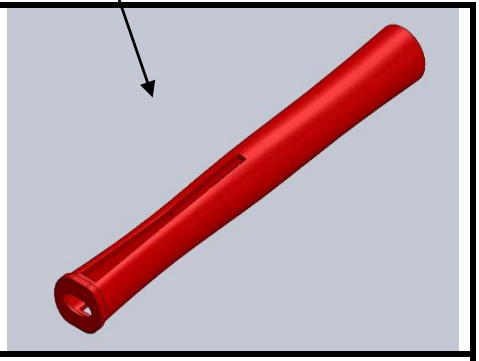
- Equipe 1 : 8h-15h
- Equipe 2 : 15h-22h

Fabrication du manche :

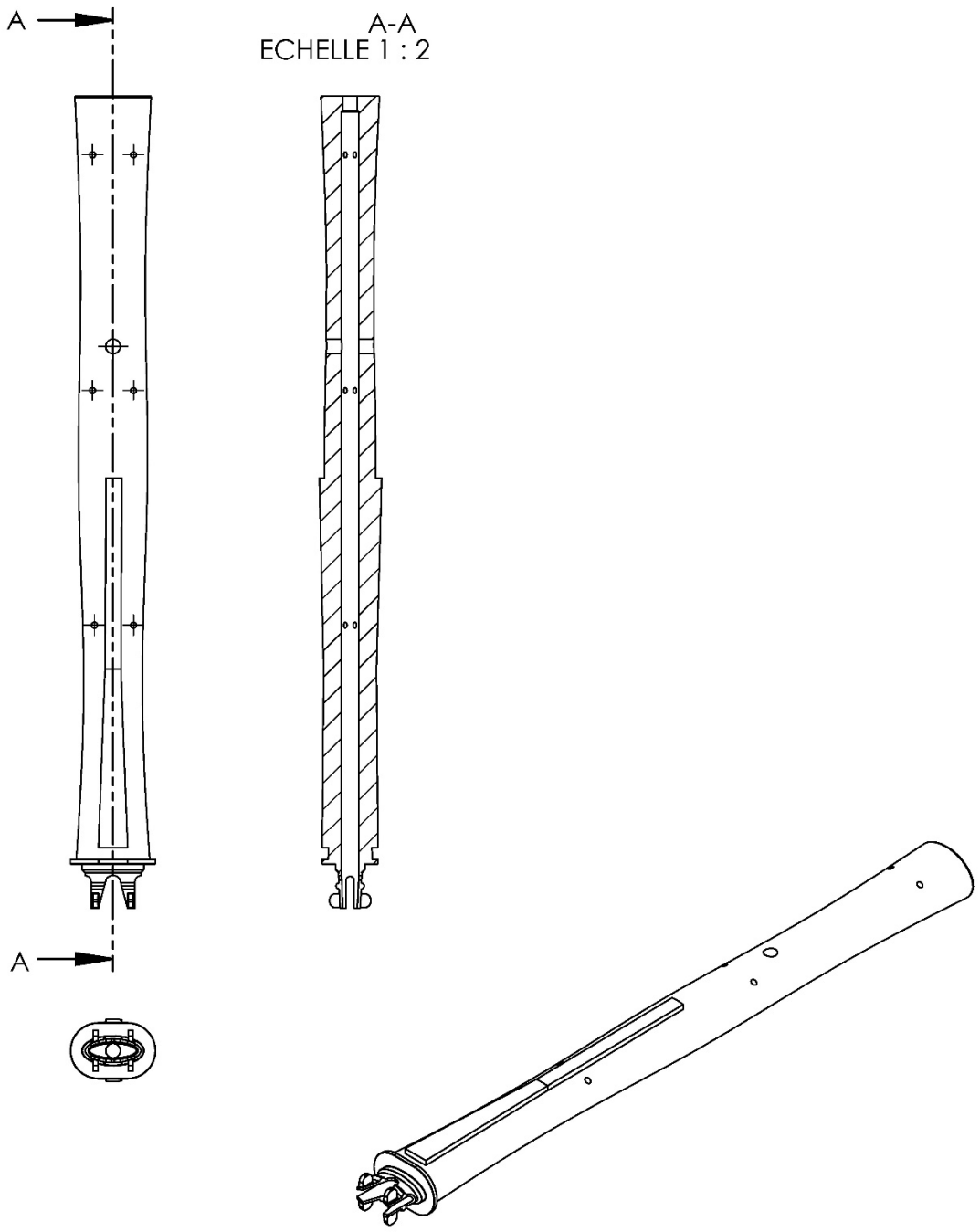
La réalisation du manche par injection se fait en 3 étapes :

1- Mise en place de l'insert (l'âme) en fibre de verre dans le moule
2- Surmoulage de l'insert par un polypropylène noir
3- Surmoulage du tout par un élastomère thermoplastique rouge



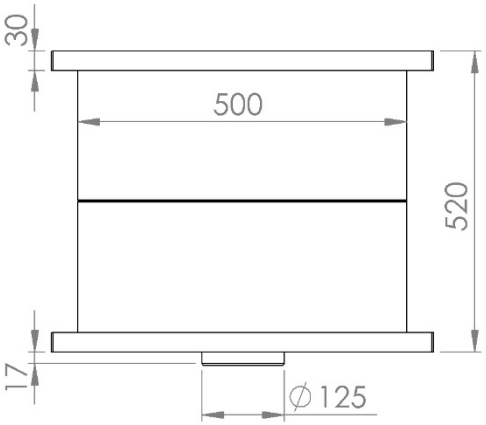
			
Nom	Insert ou âme	Surmoulage 1 (SM1)	Surmoulage 2 (SM2)
Matière	Fibre verre / résine	PP noir (2% colorant)	Elastomère rouge (3% colorant)
Taux de rebut	--	6%	6%
Description	Insert en fibre de verre et résine fabriqué par pultrusion (extrusion de thermodurcissable). Il donne sa rigidité et sa résistance mécanique au manche.	Premier surmoulage en PP noir, qui va servir d'interface entre l'âme et le grip (partie élastomère). Il donne une forme ergonomique au manche, améliore l'accrochage avec l'élastomère et fait apparaitre la marque pour laquelle le manche est fabriqué.	Deuxième surmoulage en élastomère : Celui-ci va donner une bonne adhérence au manche, améliorer l'esthétique (ajout d'une couleur) et l'amortissement des vibrations lors de l'utilisation du marteau (meilleur confort d'utilisation).

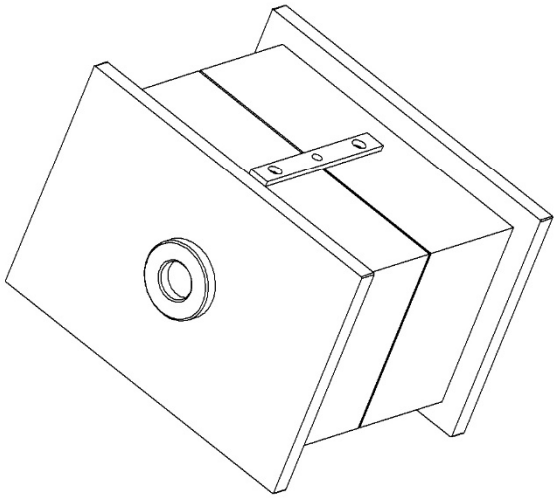
Dessin de définition du surmoulage 1

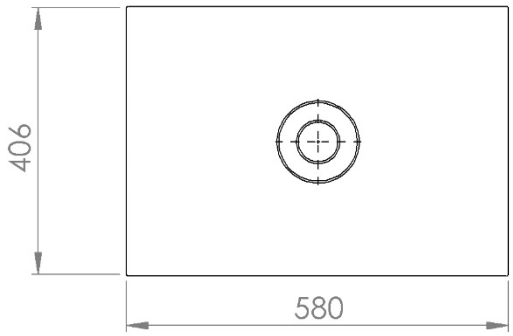


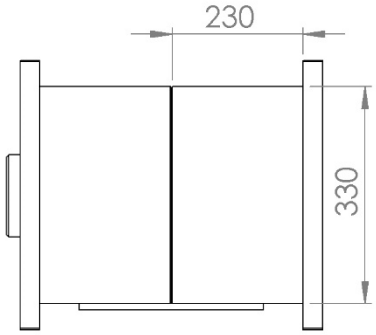
SAUF INDICATION CONTRAIRE: LES COTES SONT EN MILLIMETRES ETAT DE SURFACE: TOLERANCES: LINEAIRES: ANGULAIRES:	FINITION:		REVISION
		Surface frontale : 77,3cm²	
matiere	PP 5570PX	TITRE: Marteau SM1	
masse	**Noir**		
couleur		No. DE PLAN surmoulage 1	A4
		ECHELLE: 1/2	FEUILLE 1 SUR 1

MOULE MANCHE N°3 ref: 3-PP-EVO-26









MATIERE	ACIER XC48
MASSE VOLUMIQUE	7.7 gr/cm^3
PERTES CHARGE SM1	28 %
PERTES CHARGE SM2	22 %

Fiche matière POLYPROPYLENE thermoplastique :

DOWN.ING chemical

PP 5570PX

PP Homopolymer for Injection Molding

Product Description

PP 570P is specially developed for producing rigid injection molding articles for general purpose applications. It gives easy processability, good mechanicals, and combines a high chemical and corrosion resistance.

Typical data

Properties	Unit	Value (1)	ISO Method
Resin Properties			
Melt Flow Rate @ 230°C/2.16 kg load	g/10 min.	5.7	ISO 1133
Density @ 23°C	g/cm^3	0.905	ISO 1183
Mechanical Properties (2)			
Tensile Strength @ Yield	MPa	32	ISO 527
Tensile Elongation @ Yield	%	11	ISO 527/1C
Flexural Modulus (1% Secant)	MPa	1630	ISO 178
Notched Izod Impact Strength @ 23°C	kJ/m²	4.4/156	ISO 180/1A
Shore D Hardness @ 23°C	-	78	ISO 868
Thermal Properties(2)			
Vicat Softening Point @ 120°C/H	°C	96	ISO 306/B
Heat Deflection Temperature	°C	62	ISO 75A

(1) Typical values; not to be construed as specification limits.
(2) Based on injection molded specimens.

Processing Conditions

Barrel temperature range: 200 - 240°C
Mold Shrinkage: 1.2 - 2.5% depending on wall thickness and processing conditions
Mold Temperature: Normally 15 - 40°C, upto 65°C for thick parts

Food Regulation

PP 570P is suitable for Food contact application. Detailed information is provided in relevant Material Safety Datasheet and for additional specific information please contact SABIC local representative for certificate.

Storage and Handling

PP resin should be stored to prevent a direct exposure to sunlight and/or heat. The storage area should also be dry and preferably don't exceed 50°C. SABIC would not give warranty to bad storage conditions which may lead to quality deterioration such as color change, bad smell and inadequate product performance. It is advisable to process PP resin within 6 months after delivery.

NOTICE: The information and data contained herein are believed to be correct and given in good faith, but because of the many particular factors which are outside our knowledge and control and affect the use of product, no warranty is given or is to be implied with respect to such information, nor do we offer any immunity against infringement.

220809

Fiche matière ELASTOMERE thermoplastique

AlphaGary

TECHNICAL DATA SHEET

EVOPRENE® G 961

product description

Evoprene G SEBS polymers are the strongest and the most compatible with polyolefins of all the styrenic thermoplastic block copolymers. They are intended for use where UV resistance, soft touch and good grip performance are require.

TECHNICAL PROPERTIES

Test	Units	Test Temperature	Specification	Results
Hardness Shore A Specific	Deg	23 °C	ISO 868	34
Gravity	G/cm³	23 °C	ISO 2781	1.20
Melt flow index (2.16Kg)	G/10min	230 °C	ISO 1133	9
Tensile Strength	MPa	23 °C	ISO 37	5.3
Elongation @	%	23 °C	ISO 37	815
Break Modulus @	MPa	23 °C	ISO 37	1.1
100% Modulus @	MPa	23 °C	ISO 6383	2.0
300% Tear Strength	KN/m	23 °C		17
Abrasion resistance	Cu.mm loss	23 °C	DIN 53516	690
Compression Set 72 Hrs	%	23 °C	ISO 815	16
Compression Set 22 Hrs	%	70 °C	ISO 815	31
Compression Set 22 Hrs	%	100 °C	ISO 815	72
Air Aged 14 Days @ 125 °C				
Hardness Change	Deg		ISO 188	+4
Retained T/S	%		ISO 188	188
Retained E/B	%		ISO 188	165

Note : All tests are carried out on AG Injection mouldings.

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Issue 0238 Date: 07/07/2015 Ref: 961

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Fiche matière résine polyester DION :

REICHHOLD

[PRODUCT BULLETIN]

July 16, 2003

DION® 9800

DESCRIPTION

DION® 9800 is a premium urethane modified vinyl ester resin with many unique features: outstanding chemical resistance and high temperature performance with excellent laminating properties.

DION® 9800 has exceptional wetting characteristics with carbon and aramid as well as conventional glass fibers.

APPLICATION

- DION® 9800 is especially formulated for hand lay-up, pultrusion and filament winding.

FEATURES	BENEFITS
• Urethane modified vinyl ester polymer	• Tough, impact resistant laminates • Highly corrosion and temperature resistant • Ideal for filament winding
• Excellent wet-out with glass, carbon and aramid fibers	• Improved mechanical properties and corrosion resistance
• MEKP initiators	• Reduced air entrapment
• Preaccelerated version available	• Provides flexibility by not requiring the addition of dimethylaniline
• Manufactured using statistical process control in ISO 9002-certified plants	• Consistent batch-to-batch performance

The information herein is general information designed to assist customers in determining whether our products are suitable for their applications. Our products are intended for sale to industrial and commercial customers. We require customers to inspect and test our products before use and to satisfy themselves as to contents and suitability for their specific applications. We warrant that our products will meet our written specifications. **Nothing herein shall constitute any other warranty express or implied, including any warranty of merchantability or fitness for a particular purpose**, nor is any protection from any law or patent to be inferred. All patent rights are reserved. The exclusive remedy for all proven claims is limited to replacement of our materials and in no event shall we be liable for special, incidental or consequential damages.

919-990-7500 • 800-448-3482 • P.O. Box 13582, Research Triangle Park, NC 27709 USA • 2400 Ellis Road, Durham, NC 27703 USA • www.reichhold.com

Fiche matière résine polyester DION :

REICHHOLD [PRODUCT BULLETIN]

PROPERTIES

PHYSICAL DATA IN LIQUID FORM AT 25°C (77°F)*

Properties	Unit	Value	Test method
Specific gravity / Density	g/cm³	1.05 ± 0.02	18-030 / ISO 2811-2001
Gel time			
DION® 9800: unaccelerated	minutes	15-25	COMP02
DION® 9800-05A: preaccelerated **	minutes	30-40	COMP02
Shelf life, minimum	months	6	

CURED DATA

DION® 9800 resins are formulated for use with methyl ethyl ketone peroxide (MEKP) initiator systems. They can also be used with benzoyl peroxide. DION® 9800 requires the addition of both cobalt octoate or naphthenate, and dimethylaniline (DMA) to obtain optimal cure. DION® 9800-05A is preaccelerated with DMA and requires only cobalt octoate or naphthenate. DION® 9800 responds well to most initiators and, unlike conventional vinyl ester resins, does not foam when catalyzed with MEKP. When fabricating thick sections using DION® 9800 resins, high levels of DMA should be avoided since they can result in a very high peak exotherm. Use of cumene hydroperoxide initiator has been shown to significantly reduce exotherm while developing a rapid cure in thick laminate sections.

GUIDELINES FOR INITIATOR AND PROMOTER ADDITIONS

DION® 9800 MEKP INITIATOR

Temp. (°C)	Gel time minutes	DMA (100%) %	Co (6%) %	MEKP (9% active) %
4	30-40	0.2	0.7	2.4
10	30-40	0.1	0.6	1.8
	40-50	0.1	0.6	1.2
15	20-30	0.1	0.6	2.4
	30-40	0.1	0.6	1.8
	40-50	0.1	0.6	1.2
24	15-25	0.1	0.4	1.8
	20-30	0.1	0.4	1.4
	30-40	0.1	0.4	1.2
32	15-25	0.1	0.3	1.2
	20-30	0.1	0.2	1.2
	30-40	0.1	0.2	0.9

HANDLING AND CURING

To ensure maximum stability and maintain optimum resin properties, resins should be stored in closed containers at temperatures below 24°C/75°F and away from heat ignition sources and sunlight. Resin should be warmed to at least 18°C/65°F prior to use in order to assure proper curing and handling. All storage areas and containers should conform to local fire and building codes. Copper or copper containing alloys should be avoided as containers. Store separate from oxidizing materials, peroxides and metal salts. Keep containers closed when not in use. Inventory levels should be kept to a reasonable minimum with first-in, first-out stock rotation.

Presses à injecter Horizontales de l'Atelier PLASTITECH

Machine	Passage entre colonnes (mm)	Epaisseur moule Mini	Epaisseur moule Maxi	Diamètre de centrage du Plateau	Diamètre taraudages plateaux	Diamètre de la vis d'injection (vis1/Vis2)	Surface Vérin d'Injection (cm^2)	Volume maxi injectable Vis 1/Vis2 (cm^3)	Force de Verrouillage (KN)
DEMAG SHI H260/260-1400	600	327	562	125	M16	35/35	---	157/157	1400
BILLION HERCULE H160/270-2000	550	229	467	125	M16	32/35	---	140/157	2000
KRAUSS MAFFEI M320 H470/260-3200	735	310	620	160	M16	40/35	---	220/157	3200
BILLION SELECT H80/270-1250	650	259	357	125	M16	28/35	---	110/157	1250
BILLION PROXIMA H120-500	**sans colonne**	195	430	100	M12	30	92,8	123,7	500
ENGEL Victory H280-900	**sans colonne**	180	370	125	M12	32	116,5	116,6	900
SANDRETTO H400-950	350	110	400	115	M16	45	165	223	950

Extrait du catalogue HASCO :

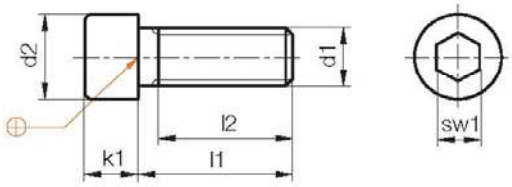
Z31/...

Zylinderschraube
Socket head cap screw
Vis à tête cylindrique à six pans creux

Mat.: 12.9/1200 N/mm²
DIN EN ISO 4762 (DIN 912)



2



	sw1	k1	l2	d2	d1	l1	Nr./No.
10	6	8	28	13	M 8	60	Z31/ 8x 60
						65	65
						70	70
						75	75
						80	80
1						90	Z31/ 8x 90
						100	100
						105	105
						110	110
						120	120
						130	130
						140	140
						150	150
						160	160
						180	180
						200	200
	8	10	5,5	16	M10	10	Z31/10x 10
			7,5			12	12
			9,5			14	14
			11,5			16	16
			13,5			18	18
			15,5			20	20
			17,5			22	22
			20,5			25	25
			25,5			30	30
			30,5			35	35
			35,5			40	40
			32			45	45
						50	50
						55	55
						60	60
						65	65
						70	70
						75	75
						80	80
						85	85
						90	90
						95	95
						100	100
						105	105
						110	110

	sw1	k1	l2	d2	d1	l1	Nr./No.
1	8	10	32	16	M10	115	Z31/10x115
						120	120
						130	130
						135	135
						140	140
						150	150
						160	160
						170	170
						180	180
						200	200
						220	220
						240	240
						260	260
						280	280
	10	12	6,8	18	M12	12	Z31/12x 12
			8,8			14	14
			10,8			16	16
			12,8			18	18
			14,8			20	20
			16,8			22	22
			19,8			25	25
			24,8			30	30
			29,8			35	35
			34,8			40	40
			39,8			45	45
			44,8			50	50
			36			55	55
						60	60
						65	65
						70	70
						75	75
						80	80
						85	85
						90	90
						95	95
						100	100
						105	105
						110	110
						115	115
						120	120

= Verpackungseinheit / packing unit / unité d'emballage

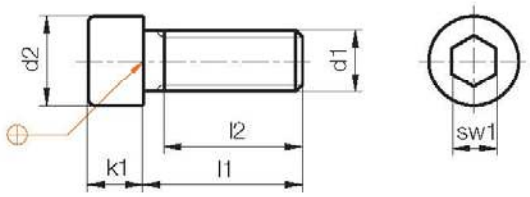
HASCO 2.5

Z31/...

Zylinderschraube
Socket head cap screw
Vis à tête cylindrique à six pans creux

Mat.: 12.9/1200 N/mm²
DIN EN ISO 4762 (DIN 912)





	sw1	k1	l2	d2	d1	l1	Nr./No.
1	10	12	36	18	**M12**	**130**	Z31/12x130
						135	135
						140	140
						145	145
						150	150
						160	160
						165	165
						170	170
						180	180
						190	190
						200	200
						220	220
						240	240
						260	260
						270	270
						280	280
						300	300
						320	320
						340	340
	12	14	19	21	**M14**	**25**	Z31/14x 25
			24			**30**	30
			29			**35**	35
			34			**40**	40
			39			**45**	45
			44			**50**	50
			49			**55**	55
			40			**60**	60
						65	65
	14	16	14	24	**M16**	**20**	Z31/16x 20
			16			**22**	22
			19			**25**	25
			24			**30**	30
			29			**35**	35
			34			**40**	40
			39			**45**	45
			44			**50**	50
			49			**55**	55
			54			**60**	60
			44			**65**	65
						70	70

	sw1	k1	l2	d2	d1	l1	Nr./No.
1	14	16	44	24	**M16**	**75**	Z31/16x 75
						80	80
						90	90
						100	100
						110	110
						120	120
						130	130
						140	140
						150	150
						160	160
						170	170
						180	180
						190	190
						200	200
						210	210
						220	220
						230	230
						240	240
						250	250
						260	260
						280	280
						300	300
						320	320
						340	340
						360	360
						380	380
						400	400
						420	420
	17	20	22,5	30	**M20**	**30**	Z31/20x 30
			27,5			**35**	35
			32,5			**40**	40
			37,5			**45**	45
			42,5			**50**	50
			47,5			**55**	55
			52,5			**60**	60
			57,5			**65**	65
			62,5			**70**	70
			67,5			**75**	75
			52			**80**	80
						90	90

= Verpackungseinheit / packing unit / unité d'emballage

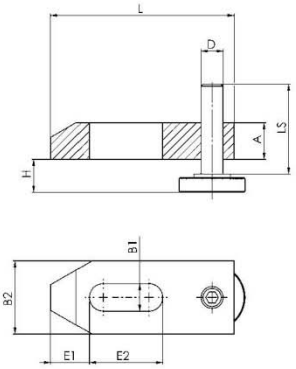
N° 6314V

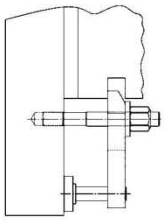
Brides droites avec vis d'appui réglable

acier de traitement, peint.

	Code	H	sim. DIN6314 B1xL	D x LS	A	B2	E1	E2	Poids [g]
	70193	10-47	14x100	M12x49	20	40	21	40	560
	70821	10-92	14x100	M12x94	20	40	21	40	635
	70219	13-52	18x125	M16x55	25	50	26	45	1110
	70839	13-87	18x125	M16x90	25	50	26	45	1230
	70201	16-65	22x160	M20x69	30	60	30	60	2050
	70847	16-105	22x160	M20x109	30	60	30	60	2230
	70151	20-83	26x200	M24x87	30	70	35	80	3200
	70854	20-133	26x200	M24x137	30	70	35	80	3470
	373928	20-83	26x250	M24x87	35	70	35	105	4340
NOUVEAU!	373936	20-133	26x250	M24x137	35	70	35	105	4520
NOUVEAU!	374405	24-150	33x315	M30x180	50	80	45	130	11215
NOUVEAU!	374439	24x150	43x400	M30x180	80	100	80	170	24350





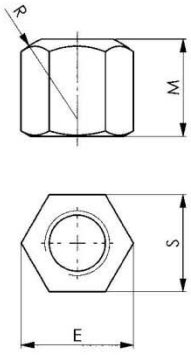


DIN 6330B

Écrou hexagonaux

haut 1,5 d, traités, résistance 10.
Utilisable par le bout sphérique avec les rondelles 6319G.





Code	Modèle	E	M	R	S	Poids [g]
82396	M12	21,9	18	17	*19	28
82321	(M14)	24,2	21	20	21	34
82412	M16	27,7	24	22	24	58
82420	(M18)	31,2	27	24	27	83
82438	M20	34,6	30	27	30	110
82339	(M22)	39,2	33	30	34	185
82453	M24	41,5	36	32	36	195
82479	M30	53,1	45	41	46	405
82487	M36	63,5	54	50	55	715

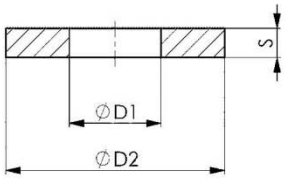
* Ancienne norme DIN.
( ) Norme DIN étendue.

DIN 6340

Rondelles plates

traitées (350 + 80 HV30)





Code	Modèle	Modèle pouce	D1	D2	S	Poids [g]
82842	M12	1/2	13	35	5	35
82859	(M14)	-	15	40	5	40
82867	M16	5/8	17	45	6	60
82875	(M18)	-	19	45	6	60
82883	M20	3/4	21	50	6	73
82891	(M22)	7/8	23	50	8	92
82909	M24	7/8	25	60	8	170
82925	M30	1 1/8, 1 3/16	31	68	10	230
82925	(M36)	1 1/4, 1 3/8	38	80	12	350

( ) extension de la DIN.
Cotes selon DIN, mais poinçonnées et planées à la presse.

Sous réserve de modifications techniques.

Extrait Fiche de sécurité MEKP

— GHS07: exclamation mark	
Labelling hazard statements	
— H242 : Heating may cause a fire — H302 : Harmful if swallowed — H314 : Causes severe skin burns and eye damage	

Classification and labelling according to GHS:

Classification	
— Organic Peroxide; Type D — Acute toxicity (oral); Category 4 — Skin corrosive; Category 1B — Eye damage; Category 1 — Acute toxicity (dermal); Category 5 — Aquatic acute toxicity; Category 2	
Signal word	
— Danger	
Pictogram	
— GHS02: flame	
— GHS05: corrosion	
— GHS07: exclamation mark	
Labelling hazard statements	
— H242 : Heating may cause a fire — H302 : Harmful if swallowed — H314 : Causes severe skin burns and eye damage — H313 : May be harmful in contact with skin — H401 : Toxic to aquatic life	

10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

— arkema.peroxides-reach-uses@arkema.com

— ICCA portal where the GPS Safety Summary is posted: http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/

GPS Safety Summary
Arkema – Functional Additives – MEKP – Methyl ethyl ketone peroxide – GPS – 2017-09-30 – V0

Extrait Fiche de sécurité résine polyester DION

REICHHOLD **Material Safety Data Sheet**

Revision Date: 19 Apr 2011

PRODUCT AND COMPANY IDENTIFICATION

Product Description: **DION® 9800-05A**

4773; 4774
Vinyl Ester Resin
Corrosion Resistant Resin

HAZARDS IDENTIFICATION

Emergency Overview:

WARNING!

Flammable Liquid
Vapors may form explosive mixtures with air
Vapor can travel to a source of ignition (spark or flame) and flash back
Harmful if swallowed
Hazardous polymerization may occur

Appearance: Amber - Clear **Physical State:** Liquid **Odor:** Pungent

Primary Routes of Entry Eye contact, Ingestion, Inhalation, Skin contact, Skin absorption.

Acute Effects

Eyes: Irritating to eyes.

Skin: Harmful by skin absorption. Contact causes skin irritation. Prolonged skin contact may defat the skin and produce dermatitis.

Inhalation: Harmful by inhalation. May cause irritation of respiratory tract. Inhalation of high vapor concentrations can cause CNS-depression and narcosis.

Ingestion: Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration hazard if swallowed - can enter lungs and cause damage. Ingestion is not an anticipated route of exposure for this material in industrial use.

Chronic Effects: This material contains a chemical which is listed by the International Agency for Research on Cancer (IARC) as a group 2B cancer causing agent (possibly carcinogenic to humans).

Liver, Kidney, Central nervous system (CNS), Respiratory system.

FIRST AID MEASURES

Skin Contact: Wash off with warm water and soap. Remove contaminated clothing and shoes. If skin irritation persists, call a physician. Wash contaminated clothing before reuse.

Eye Contact: Immediately flush eyes for at least 15 minutes. Get medical attention.

Inhalation: Remove person to fresh air. If signs/symptoms continue, get medical attention. Keep patient warm and at rest. If not breathing, give artificial respiration. If breathing is labored, administer oxygen. Get medical attention immediately.

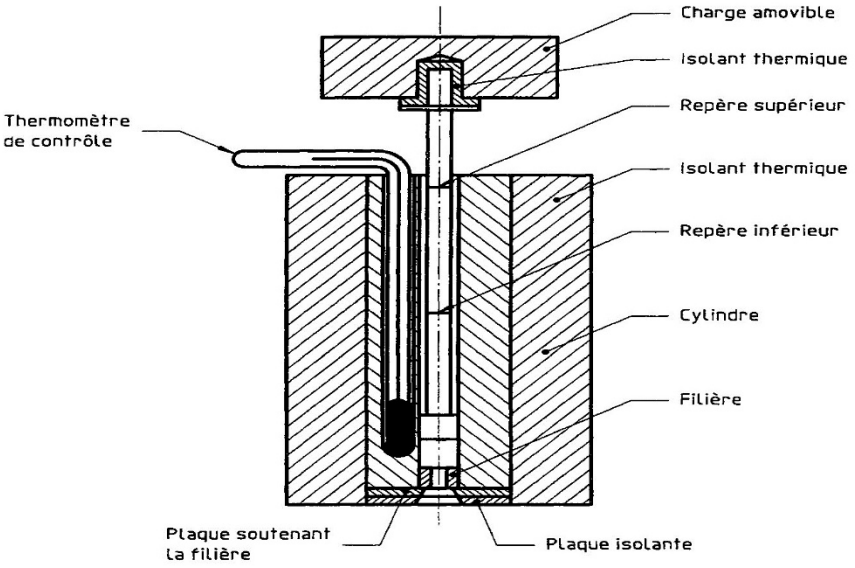
EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Use general ventilation to maintain airborne concentrations to levels that are below regulatory and recommended occupational exposure limits. Local ventilation may be required during certain operations. Use explosion-proof equipment.

Personal Protective Equipment
Eye/face Protection: Wear safety glasses with side shields and a faceshield or goggles and a faceshield. Ensure that eyewash stations and safety showers are close to the workstation location.

Extrait norme pour l'essai MFI ISO 1133

(ISO 1133 : 1997)	Determination of the melt mass-flow rate (MFR) of thermoplastics English version of DIN EN ISO 1133	EN ISO 1133



4 Procedure A

4.1 Clean the apparatus (see 5.2). Before beginning a series of tests, ensure that the cylinder (3.1.2) has been at the selected temperature for not less than 15 min.

4.2 Then charge the cylinder with 3 g to 8 g of the sample according to the anticipated melt flow rate (see, as a guide, table 2). During the charging, compress the material with the packing rod (3.2.1.1), using hand pressure. To ensure a charge as free from air as possible for material susceptible to oxidative degradation, complete the charging process in 1 min. Put the piston, loaded or unloaded according to the flow rate of the material, in the cylinder.

Table 2

Melt flow rate g/10 min	**Mass of test sample in cylinder** g	**Extrudate cut-off time-interval** s
>0,1 but < 0.5	3 to 5	240
> 0,5 but < 1	4 to 6	120
> 1 but < 3,5	4 to 6	60
> 3,5 but < 10	6 to 8	30
> 10	6 to 8	5 to 15

1) It is recommended that melt a flow rate should not be measured if the value obtained is less than 0,1 g/10 min or greater than 100 g/10 min.

4.3 The melt mass-flow rate (MFR), also named melt flow index (MFI), expressed in grams per 10 min, is given by the equation:

$$MFR(e,M) = (m \times t_{ref}) / t$$

e is the test temperature, in degrees Celsius;
M is the nominal load, in kilograms;
m is the average mass, in grams, of the cut-offs;
t_{ref} is the reference time in seconds (600 s);
t is the cut-off time-interval, in seconds.

Extrait norme pour l'essai MFI ISO 1133

Annex A
Test conditions for melt flow rate determination

The conditions used shall be as indicated in the appropriate material designation or specification. Table A.1 indicates test conditions that have been found useful.

Table A.1

Conditions (code letter)	**Test temperature,** θ, °C	**Nominal load (combined),** kg
A	250	2,16
B	150	2,16
D	190	2,16
E	190	0,325
F	190	10,00
G	190	21,60
H	200	5,00
M	230	2,16
N	230	3,80
S	280	2,16
T	190	5,00
U	220	10,00
W	300	1,20
Z	125	0,325

NOTE — If, in the future, conditions other than those listed in this table are necessary, e.g. for new thermoplastics, only the loads already in use shall be chosen. Temperatures shall also be selected from those already in the table. If absolutely necessary, new temperatures might have to be taken because of the nature of the new thermoplastic.

Annex B
Conditions in use for the designation for standards thermoplastic materials

Table B.1 indicates test conditions that are currently specified in relevant International Standards. Other test conditions not listed here may be used, if necessary, for a particular material.

Table B.1

International Standard (see clause 2)	Materials	Conditions (code letter)	Test temperature, θ °C	Nominal load (combined), m_{nom} kg
ISO 1622-1	PS	H	200	5,00
ISO 1872-1	PE	D	190	2,16
ISO 1872-1	PE	T	190	5,00
ISO 1873-1	PP	M	230	2,16
ISO 2580-1	ABS	U	220	10,00
ISO 2897-1	PS-1	H	200	5,00
ISO 7391-1	PC	W	300	1,20
ISO 8257-1	PMMA	N	230	3,80
ISO 9988-1	POM	D	190	2,16
ISO 10366-1	MABS	U	220	10,00

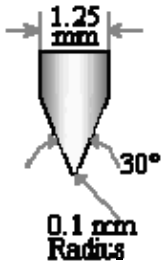
Extrait de la norme ISO 868 dureté shore :

ISO 868 Test Standard Explained
Shore Hardness - ISO 868

measure of the indentation resistance of elastomeric or soft plastic materials based on the depth of penetration of a conical indentor. Hardness values range from 0 (for full penetration) to 100 (for no penetration). Full penetration is between 2.46 and 2.54 mm (0.097 and 0.100 in) depending on the equipment used.

It is recommended that Durometer D tests be used when Durometer A results are greater than 90 and that Durometer A tests be used when Durometer D results are less than 20. Durometer A values less than 10 are inexact and are not reported.

Delayed hardness results are sometimes reported. The delay is the time (in seconds) in between application of the indentor and when the hardness is read. If a delay is not reported, the hardness value is the instantaneous hardness (within 1 second).

Durometer	Use	Indentor
A	Used for softer materials.	
D	Used for harder materials.	

Shown below is a hardness comparison chart. Hardness is a complex material property influenced by a variety of factors. Any conversions using this chart will be a rough estimate and should not be considered an exact conversion

Feuille de suivi de production

Atelier : **INJECTION**	Produit : **Manche N°3 Rouge**	Matière : **PP 5570 Noir**
Date :	Contrôleurs : **Opérateurs des différentes équipes**	
Caractéristique contrôlée : **Masse surmoulage 1 (53 g $^{\pm 0,1}$)**		

Tableau de synthèse des mesures (5 manches toutes les 30 minutes)								
Heure	**8H00**	**8H30**	**9H00**	**9H30**	**10H00**	**10H30**	**11H00**	**11H30**
Mesure 1	53,03	53,01	53,00	53,00	53,02	52,98	53,00	52,98
Mesure 2	53,02	53,01	53,01	53,00	52,97	52,97	53,01	52,98
Mesure 3	53,02	53,00	53,00	52,98	53,03	52,90	52,97	52,99
Mesure 4	53,02	53,01	52,98	52,98	53,07	52,91	53,03	53,03
Mesure 5	53,01	53,01	52,99	52,99	53,05	52,94	52,99	53,07
Heure	**12H00**	**12H30**	**13H00**	**13H30**	**14H00**	**14H30**	**15H00**	
Mesure 1	53,03	53,00	53,05	53,01	53,06	52,98	53,01	
Mesure 2	53,07	52,98	53,04	53,01	53,01	52,98	52,97	
Mesure 3	53,01	52,99	53,03	53,01	53,03	52,99	52,98	
Mesure 4	53,97	53,06	53,04	53,03	53,01	53,01	52,99	
Mesure 5	53,03	53,01	53,03	53,01	52,98	52,98	53,03	

Journal de bord du suivi de production

Atelier : **Injection**	Produit : **Manche N°3 Rouge**	Matière : **PP 5570 Noir**
Date :	Contrôleurs : **Opérateurs des différentes équipes**	
Caractéristique contrôlée : **Masse surmoulage 1**		

8H00	RAS
8H30	RAS
9H00	RAS
9H30	***9H40 :*** *Problème sur un thermorégulateur (baisse température moule)*
10H00	RAS
10H30	***10H35 :*** *Défaut démoulage : portion de pièce coincée dans le moule (rupture de cycle)*
11H00	RAS
11H30	RAS
12H00	RAS
12H30	RAS
13H00	***13H10 :*** *Réajustement des paramètres d'injection*
13H30	RAS
14H00	RAS
14H30	RAS
15H00	***15H00 :*** *Arrêt de la production*

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