

# Zytel® 101 NC010

## NYLON RESIN

Zytel® 尼龙树脂的共性包括良好的机械和物理性能，例如高机械强度，刚性和韧性之间良好的平衡，良好的高温性能、电性能和阻燃性能，优异的耐磨损和耐化学品性能。

另外，Zytel® 尼龙树脂有不同改性和增强规格为特殊加工和终端客户提供定制的性能。

Zytel® 尼龙树脂，包括大多数阻燃规格，提供了染色可能性。

Zytel® 尼龙树脂良好的热稳定性通常使正确处理的生产废弃物回收成为可能。如果不能回收使用，杜邦建议的优先选择是在合适的装置中焚烧进行能量回收（基体树脂-31kJ/g）。废弃处理需遵守当地法规。

Zytel® 尼龙树脂通常应用于要求严苛的汽车、家具、家用电器、运动器材和建筑业。

Zytel® 101 NC010是一种未增强 尼龙66

### 总说明

|       |                               |           |
|-------|-------------------------------|-----------|
| 树脂鉴别  | PA66                          | ISO 1043  |
| 制品标识码 | >PA66<                        | ISO 11469 |
| ISO名称 | ISO 16396-PA66,,M1G1N,S14-030 |           |

### 流变性能

|           |                      |                    |                     |
|-----------|----------------------|--------------------|---------------------|
|           | dry/cond.            |                    |                     |
| 熔体质量流动速率  | 23/*                 | g/10min            | ISO 1133            |
| 熔体质量流率，温度 | 275/*                | °C                 | ISO 1133            |
| 熔体质量流率，载荷 | 2.16/*               | kg                 | ISO 1133            |
| 粘数        | 150/* <sup>[1]</sup> | cm <sup>3</sup> /g | ISO 307, 1157, 1628 |
| 模塑收缩率，平行  | 1.4/-                | %                  | ISO 294-4, 2577     |
| 模塑收缩率，垂直  | 1.4/-                | %                  | ISO 294-4, 2577     |

[1]: Sulfuric acid 96%

### 机械性能

|                  |           |                   |              |
|------------------|-----------|-------------------|--------------|
|                  | dry/cond. |                   |              |
| 拉伸模量             | 3100/1400 | MPa               | ISO 527-1/-2 |
| 屈服应力             | 82/55     | MPa               | ISO 527-1/-2 |
| 屈服伸长率            | 4.5/25    | %                 | ISO 527-1/-2 |
| 名义断裂伸长率          | 25/>50    | %                 | ISO 527-1/-2 |
| 断裂伸长率            | 45/-      | %                 | ISO 527-1/-2 |
| 弯曲模量             | 2800/1200 | MPa               | ISO 178      |
| 弯曲强度             | 90/54     | MPa               | ISO 178      |
| 拉伸蠕变模量，1h        | */1200    | MPa               | ISO 899-1    |
| 拉伸蠕变模量，1000h     | */700     | MPa               | ISO 899-1    |
| 简支梁无缺口冲击强度，+23°C | N/N       | kJ/m <sup>2</sup> | ISO 179/1eU  |
| 简支梁无缺口冲击强度，-30°C | 400/N     | kJ/m <sup>2</sup> | ISO 179/1eU  |
| 简支梁缺口冲击强度，+23°C  | 5.5/15    | kJ/m <sup>2</sup> | ISO 179/1eA  |
| 简支梁缺口冲击强度，-30°C  | 4.5/3     | kJ/m <sup>2</sup> | ISO 179/1eA  |
| 悬臂梁缺口冲击强度，23°C   | 5.5/12    | kJ/m <sup>2</sup> | ISO 180/1A   |
| 悬臂梁缺口冲击强度，-30°C  | 5.5/-     | kJ/m <sup>2</sup> | ISO 180/1A   |
| 悬臂梁缺口冲击强度，-40°C  | 5.5/-     | kJ/m <sup>2</sup> | ISO 180/1A   |
| 无缺口悬臂梁冲击强度，23°C  | N/N       | kJ/m <sup>2</sup> | ISO 180/1U   |



# Zytel® 101 NC010

## NYLON RESIN

|                   |           |                   |            |
|-------------------|-----------|-------------------|------------|
| 无缺口悬臂梁冲击强度, -30°C | 300/-     | kJ/m <sup>2</sup> | ISO 180/1U |
| 洛氏硬度              | 79/59     | -                 | ISO 2039-2 |
| 洛氏硬度, Rockwell    | 121/108   | -                 | ISO 2039-2 |
| 球压痕硬度             | 180/85    | MPa               | ISO 2039-1 |
| 球压痕硬度             | 160/*     | MPa               | ISO 2039-1 |
| Poisson's ratio   | 0.37/0.43 | -                 |            |
| 耐磨性               | 6/*       | mm <sup>3</sup>   | ISO 4649   |

### Tribological properties

|               |           |  |           |
|---------------|-----------|--|-----------|
|               | dry/cond. |  |           |
| 静态摩擦系数, 铁     | -/0.2     |  | ASTM 1894 |
| 滑动摩擦系数, 1h, 钢 | -/0.28    |  | ASTM 1894 |

### 热性能

|                      |           |                   |                |
|----------------------|-----------|-------------------|----------------|
|                      | dry/cond. |                   |                |
| 熔融温度, 10°C/min       | 262/*     | °C                | ISO 11357-1/-3 |
| 玻璃化转变温度, 10°C/min    | 65/-      | °C                | ISO 11357-1/-2 |
| 热变形温度, 1.80 MPa      | 70/*      | °C                | ISO 75-1/-2    |
| 热变形温度, 0.45 MPa      | 190/*     | °C                | ISO 75-1/-2    |
| 维卡软化温度, 50°C/h 50N   | 240/*     | °C                | ISO 306        |
| 线膨胀系数, 平行            | 100/*     | E-6/K             | ISO 11359-1/-2 |
| 线膨胀系数, 垂直            | 110/*     | E-6/K             | ISO 11359-1/-2 |
| 固态导热系数               | 0.24      | W/(m K)           |                |
| 熔体                   | 0.16      | W/(m K)           |                |
| 有效导热率 <sub>a</sub>   | 9.0E-8    | m <sup>2</sup> /s |                |
| 熔体的比热                | 2790      | J/(kg K)          |                |
| 固态比热容                | 1680      | J/(kg K)          |                |
| 相对温度指数, 电气性能, 0.75mm | 130       | °C                | UL 746B        |
| 相对温度指数, 电气性能, 1.5mm  | 130       | °C                | UL 746B        |
| 相对温度指数, 电气性能, 3mm    | 130       | °C                | UL 746B        |
| 相对温度指数, 电气性能, 6mm    | 130       | °C                | UL 746B        |
| 相对温度指数, 冲击, 0.75mm   | 75        | °C                | UL 746B        |
| 相对温度指数, 冲击, 1.5mm    | 75        | °C                | UL 746B        |
| 相对温度指数, 冲击, 3mm      | 75        | °C                | UL 746B        |
| 相对温度指数, 冲击, 6mm      | 75        | °C                | UL 746B        |
| 相对温度指数, 强度, 0.75mm   | 85        | °C                | UL 746B        |
| 相对温度指数, 强度, 1.5mm    | 85/*      | °C                | UL 746B        |
| 相对温度指数, 强度, 3mm      | 85        | °C                | UL 746B        |
| 相对温度指数, 强度, 6mm      | 85        | °C                | UL 746B        |

### 燃烧性能

|                |           |       |                 |
|----------------|-----------|-------|-----------------|
|                | dry/cond. |       |                 |
| 1.5mm名义厚度时的燃烧性 | V-2/*     | class | IEC 60695-11-10 |
| 测试用试样的厚度       | 1.5/*     | mm    | IEC 60695-11-10 |
| UL注册           | yes/*     | -     | UL 94           |
| 厚度为h时的燃烧性      | V-2/*     | class | IEC 60695-11-10 |
| 测试用试样的厚度       | 0.71/*    | mm    | IEC 60695-11-10 |



# Zytel® 101 NC010

## NYLON RESIN

|                  |       |    |                      |
|------------------|-------|----|----------------------|
| UL注册             | yes/* | -  | UL 94                |
| 燃烧性 - 氧指数        | 28/*  | %  | ISO 4589-1/-2        |
| 灼热丝燃烧指数, 0.75mm  | 960/- | °C | IEC 60695-2-12       |
| 灼热丝燃烧指数, 1.5mm   | 960/- | °C | IEC 60695-2-12       |
| 灼热丝燃烧指数, 3mm     | 960/- | °C | IEC 60695-2-12       |
| 灼热丝起燃温度, 0.75mm  | 725/- | °C | IEC 60695-2-13       |
| 灼热丝起燃温度, 1.5mm   | 750/- | °C | IEC 60695-2-13       |
| 灼热丝起燃温度, 3mm     | 800/- | °C | IEC 60695-2-13       |
| 灼热丝温度, 无火, 1mm   | 805/- | °C | IEC 60335-1          |
| 灼热丝温度, 无火, 1.5mm | 775/- | °C | IEC 60335-1          |
| 灼热丝温度, 无火, 2mm   | 700/- | °C | IEC 60335-1          |
| FMVSS Class      | DNI   | -  | ISO 3795 (FMVSS 302) |

### 电性能

|                |           |       |               |
|----------------|-----------|-------|---------------|
|                | dry/cond. |       |               |
| 相对介电常数., 100Hz | 3.8/6     | -     | IEC 62631-2-1 |
| 相对介电常数., 1MHz  | 3.5/4     | -     | IEC 62631-2-1 |
| 介质损耗因子, 100Hz  | 80/2100   | E-4   | IEC 62631-2-1 |
| 介质损耗因子, 1MHz   | 180/750   | E-4   | IEC 62631-2-1 |
| 体积电阻率          | 1E13/1E11 | Ohm.m | IEC 62631-3-1 |
| 表面电阻率          | */1E12    | Ohm   | IEC 62631-3-2 |
| 介电强度           | 32/28     | kV/mm | IEC 60243-1   |
| 相对漏电起痕指数       | 600/-     | -     | IEC 60112     |
| 相对漏电起痕指数M      | 475/-     | -     | IEC 60112     |
| 介电常数           | 3.1/-     | -     | ASTM D 2520 B |
| 介电常数           | 3/-       | -     | ASTM D 2520 B |

### 其它性能

|              |           |                   |          |
|--------------|-----------|-------------------|----------|
|              | dry/cond. |                   |          |
| 吸湿性, 2mm     | 2.6/*     | %                 | 类似ISO 62 |
| 吸水性, 2mm     | 8.5/*     | %                 | 类似ISO 62 |
| 密度           | 1140/-    | kg/m <sup>3</sup> | ISO 1183 |
| 熔体密度         | 980       | kg/m <sup>3</sup> |          |
| 吸水性, 浸泡 24小时 | 1.2/*     | %                 | 类似ISO 62 |

### 机械性能(薄膜)

|                     |           |  |                |
|---------------------|-----------|--|----------------|
|                     | dry/cond. |  |                |
| 最大应力, parallel      | 80/*      | MPa                                      | ISO 527-3      |
| 最大应力, normal        | 75/*      | MPa                                      | ISO 527-3      |
| 最大应变., parallel     | 300/*     | %  | ISO 527-3      |
| 最大应变., normal       | 250/*     | %  | ISO 527-3      |
| 光泽度, 60°            | 90/*      | -  | ISO 2813       |
| 浑浊率                 | 0.02/*    | -  | ISO 14782      |
| 下水蒸汽透过率, 23°C/85%RH | 8/*       | g/(m <sup>2</sup> *d)                    | DIS 15106-1/-2 |
| 下氧气透过率, 23°C/0%RH   | 12/*      | cm <sup>3</sup> /(m <sup>2</sup> *d*bar) | DIS 15105-1/-2 |
| 下二氧化碳透过率, 23°C/0%RH | 45/*      | cm <sup>3</sup> /(m <sup>2</sup> *d*bar) | DIS 15105-1/-2 |
| 试样厚度                | 0.1/*     | mm                                       |                |



# Zytel® 101 NC010

## NYLON RESIN

### VDA性能

|          |           |        |          |
|----------|-----------|--------|----------|
|          | dry/cond. |        |          |
| 有机化合物的排放 | 5         | □ gC/g | VDA 277  |
| 气味测试     | 3         | class  | VDA 270  |
| 雾化       | 99/*      | %      | ISO 6452 |
| 雾化       | 0.1/*     | mg     | ISO 6452 |

### 注塑

|             |              |
|-------------|--------------|
| 建议干燥        | 是            |
| 干燥温度        | 80 °C        |
| 干燥时间, 除湿干燥机 | 2 - 4 h      |
| 加工前水分含量     | ≤ 0.2 %      |
| 最优熔体温度      | 290 °C       |
| 注塑 熔体温度     | 280 °C       |
| 注塑 熔体温度     | 300 °C       |
| 螺杆最大切线速度    | 0.4 m/s      |
| 最优模具温度      | 70 °C        |
| 模具温度        | 50 °C        |
| 模具温度        | 90 °C        |
| 保压范围        | 50 - 100 MPa |
| 保压时间        | 4 s/mm       |
| 喷射温度        | 190 °C       |

### 薄膜挤出成型

|             |              |
|-------------|--------------|
| 干燥温度        | ≤ 80 °C      |
| 干燥时间, 除湿干燥机 | 4 - 6 h      |
| 最优熔体温度      | 285 °C       |
| 熔体温度范围      | 275 - 290 °C |

### 成型

注塑

### POSTPROCESSING

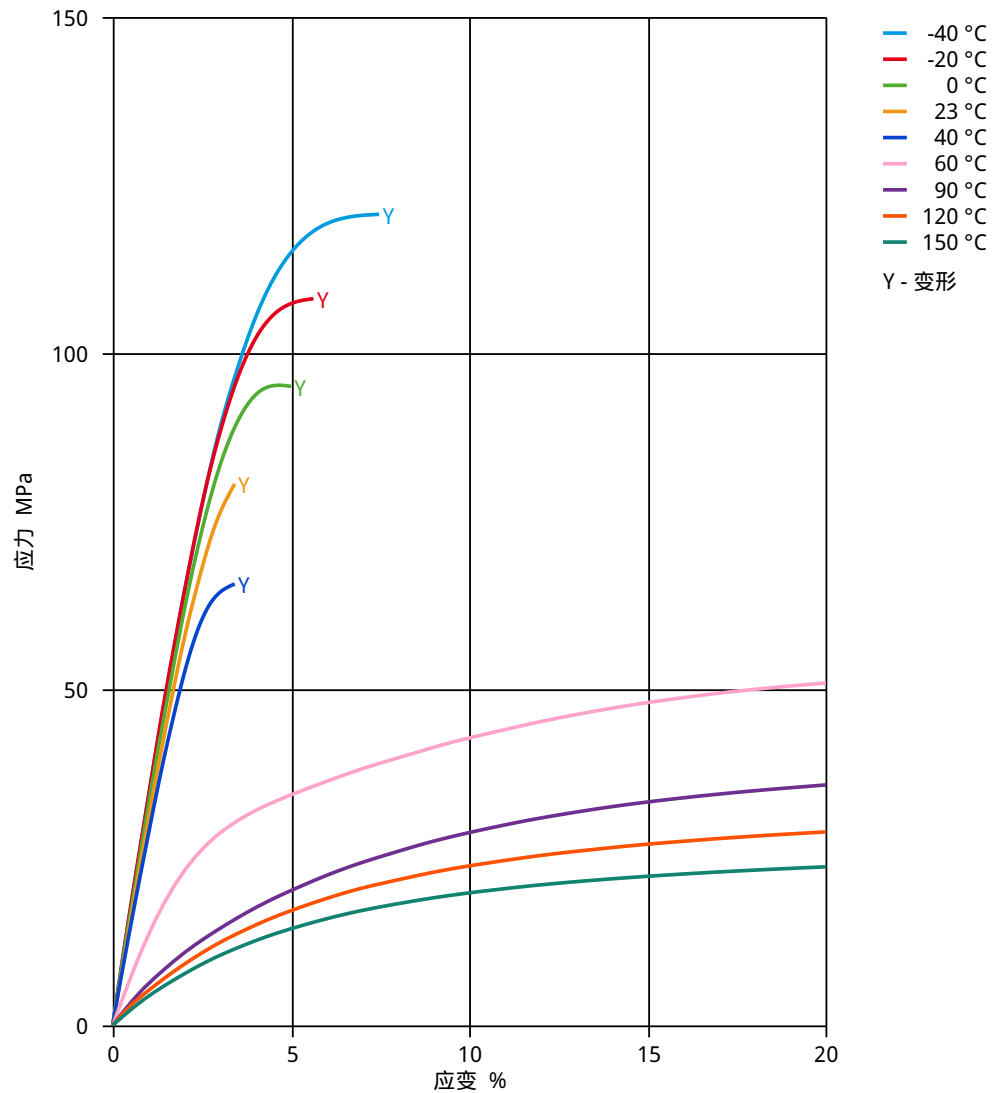
Annealing: 30min at 200°C



# Zytel® 101 NC010

NYLON RESIN

应力 - 应变. (dry)

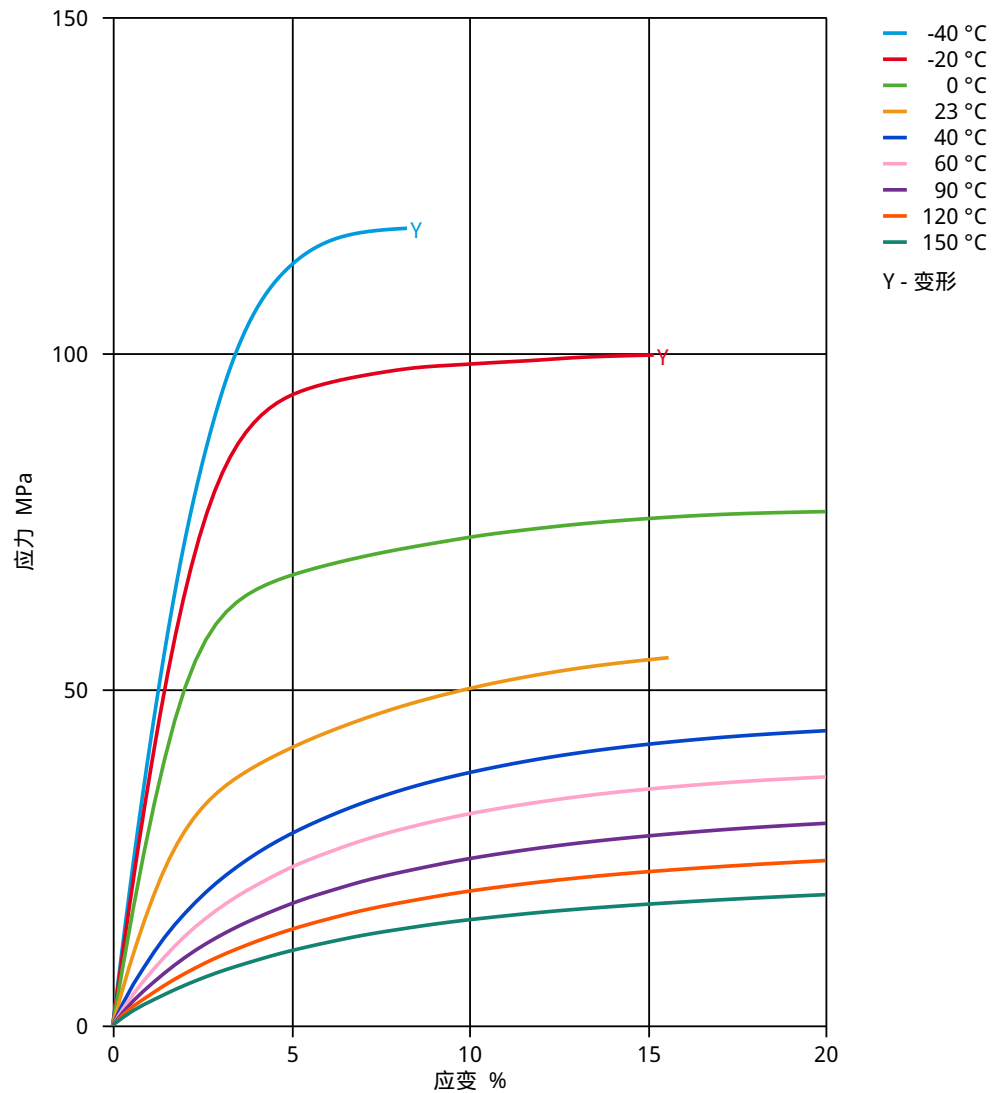




# Zytel® 101 NC010

NYLON RESIN

应力 - 应变. (cond.)

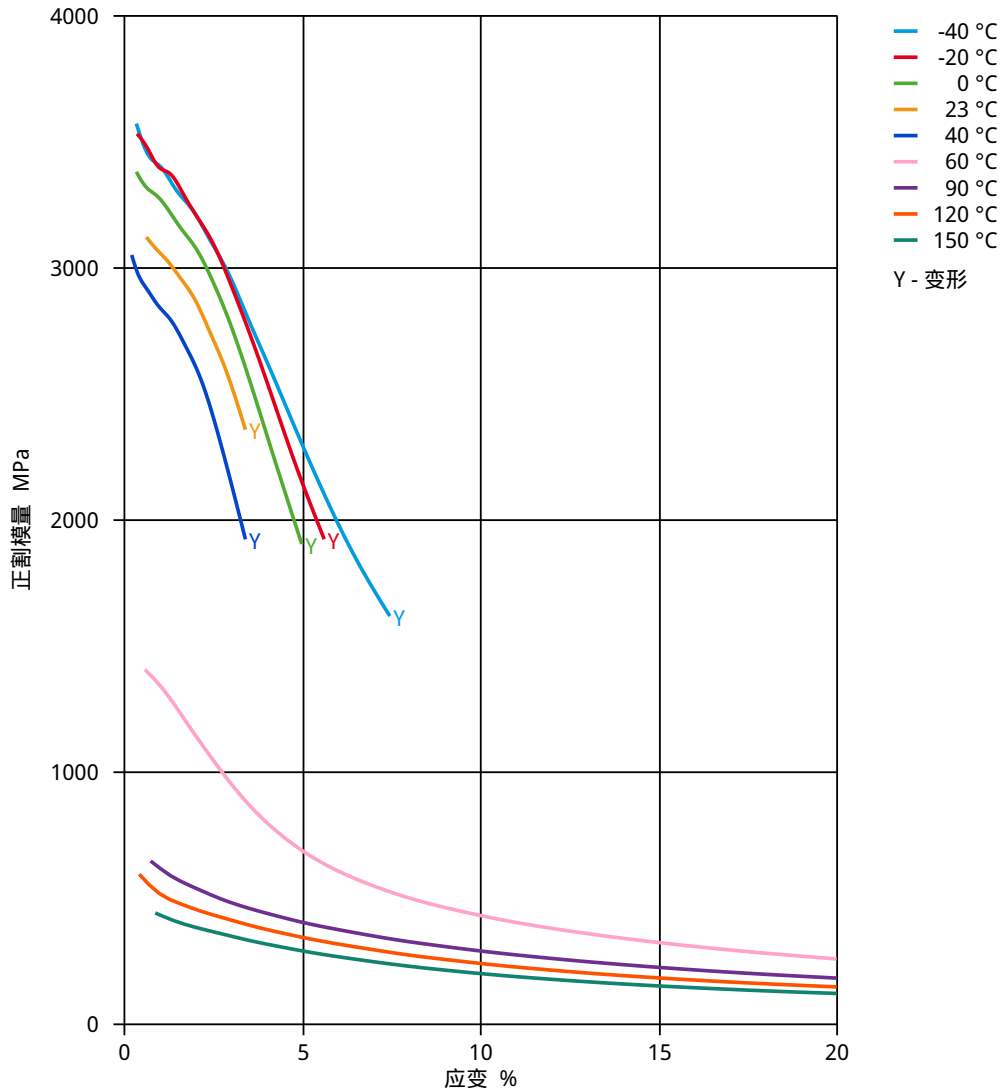




# Zytel® 101 NC010

NYLON RESIN

正割模量 - 应变. (dry)

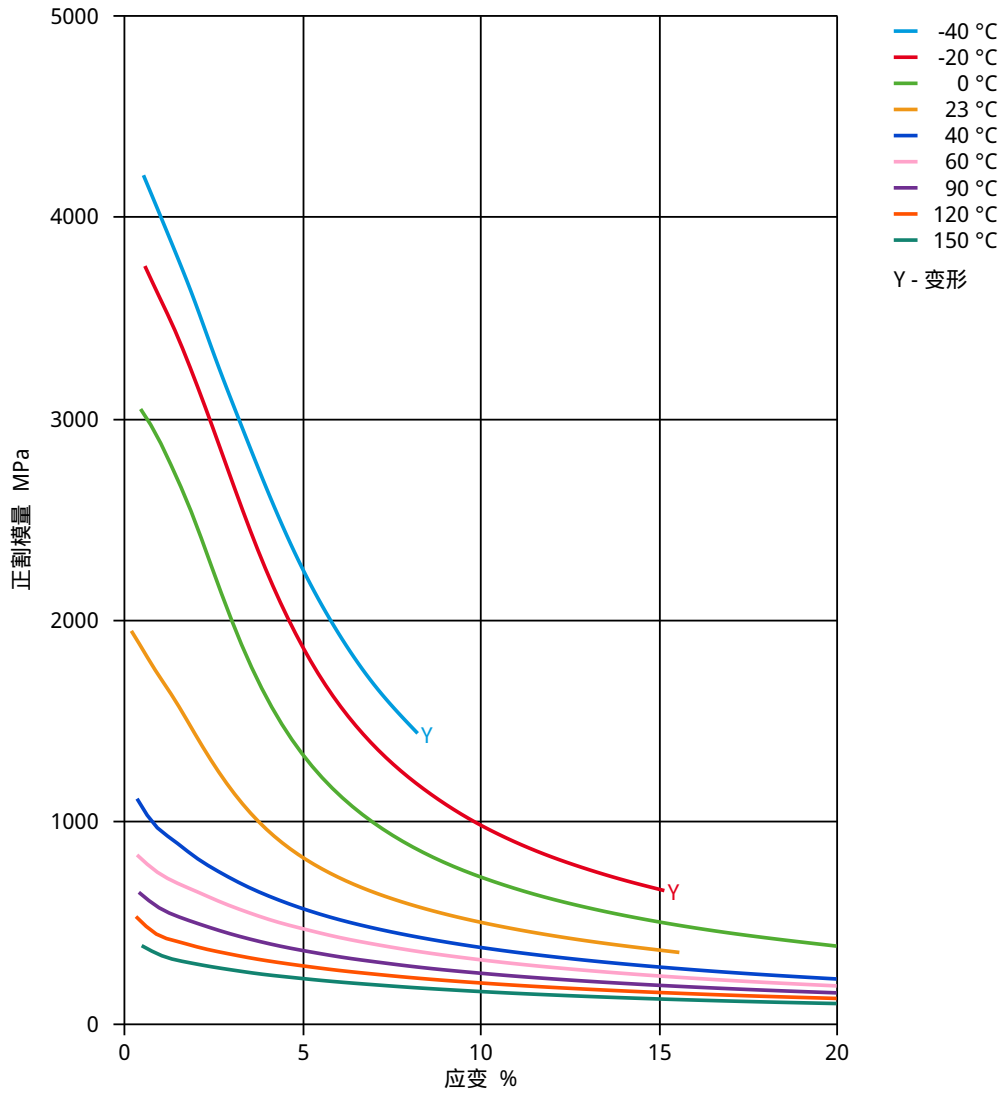




# Zytel® 101 NC010

NYLON RESIN

正割模量 - 应变. (cond.)





# Zytel® 101 NC010

## NYLON RESIN

### 耐化学性

#### 酸类

- ✓ 醋酸 (5g/100g), 23°C
- ✓ 柠檬酸溶液 (10g/100g), 23°C
- ✓ 乳酸 (10g/100g), 23°C
- ✗ 盐酸 (36g/100g), 23°C
- ✗ 硝酸 (40g/100g), 23°C
- ✗ 硫酸 (38g/100g), 23°C
- ✗ 硫酸 (5g/100g), 23°C
- ✗ 铬酸溶液 (40g/100g), 23°C

#### 碱类

- ✗ 氢氧化钠溶液 (35g/100g), 23°C
- ✓ 氢氧化钠溶液 (1g/100g), 23°C
- ✓ 氨水(氢氧化铵) (10g/100g), 23°C

#### 醇类

- ✓ 异丙醇, 23°C
- ✓ 甲醇, 23°C
- ✓ 乙醇, 23°C

#### 碳氢化合物

- ✓ n-乙烷, 23°C
- ✓ 甲苯, 23°C
- ✓ 异辛烷, 23°C

#### 酮类

- ✓ 丙酮, 23°C

#### 醚类

- ✓ (二)乙醚, 23°C

#### 矿物油

- ✓ SAE 10W40号多效润滑油, 23°C
- ✗ SAE 10W40号多效润滑油, 130°C
- ✗ SAE 89/90号变速箱润滑油, 130°C
- ✓ 绝缘油, 23°C

#### 标准燃油

- ✓ ISO 1817 燃油1号, 60°C
- ✓ ISO 1817 燃油2号, 60°C
- ✓ ISO 1817 燃油3号, 60°C
- ✓ ISO 1817 燃油4号, 60°C
- ✓ 不含酒精的标准燃油(优先使用C类ISO 1817 燃油), 23°C
- ✓ 含酒精的标准燃油(优先使用4号ISO 1817 燃油), 23°C
- ✓ 柴油(优先使用F类ISO 1817液体), 23°C
- ✗ 柴油(优先使用F类ISO 1817液体), 90°C
- ✗ 柴油(优先使用F类ISO 1817液体), >90°C

# Zytel® 101 NC010

## NYLON RESIN

### 盐溶液

- ✓ 氯化钠溶液(10g/100g), 23°C
- ✗ 次氯化钠溶液 (10g/100g), 23°C
- ✓ 碳酸钠溶液 (20g/100g), 23°C
- ✓ 碳酸钠溶液 (2g/100g), 23°C
- ✗ 氯化锌溶液 (50g/100g), 23°C

### 其它

- ✓ 乙酸乙酯, 23°C
- ✗ 过氧化氢, 23°C
- ✗ DOT4号刹车油, 130°C
- ✗ 乙二醇水溶液 (50g/100g), 108°C
- ✓ 1g/100g 基苯氧-聚环氧乙烷乙烯水溶液, 23°C
- ✓ 油酸 (50g/100g) + 橄榄油 (50g/100g), 23°C
- ✓ 水, 23°C
- ✗ 去离子水, 90°C
- ✗ 酚溶液(5g/100g), 23°C

### Symbols used:

- ✓ possibly resistant  
Defined as: Supplier has sufficient indication that contact with chemical can be potentially accepted under the intended use conditions and expected service life. Criteria for assessment have to be indicated (e.g. surface aspect, volume change, property change).
- ✗ not recommended - see explanation  
Defined as: Not recommended for general use. However, short-term exposure under certain restricted conditions could be acceptable (e.g. fast cleaning with thorough rinsing, spills, wiping, vapor exposure).

The information set forth herein is furnished free of charge, is based on technical data that DuPont believes to be reliable, and represents typical values that fall within the normal range of properties. This information relates only to the specific material designated and may not be valid for such material used in combination with other materials or in other processes. It is intended for use by persons having technical skill, at their own discretion and risk. This information should not be used to establish specification limits nor used alone as the basis of design. Handling precaution information is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards and comply with applicable law. Since conditions of product use and disposal are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information. As with any product, evaluation under end-use conditions prior to specification is essential. Nothing herein is to be taken as a license to operate or a recommendation to infringe on patents.

CAUTION: Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract or other acknowledgement that is consistent with the DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative.

DuPont's sole warranty is that our products will meet our standard sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, DUPONT SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR NON-INFRINGEMENT. DUPONT DISCLAIMS LIABILITY FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.