Quenchant tests are based on ISO 9950 (=IP 414) standard using an Inconel 600 cylindrical probe/Drasticimeter Peckly with an initial probe temperature of 850° C. and a quenchant bath temperature of 40° C. A pumped agitation system is used to ensure a homogeneous turbulent flow of quenchant around the probe. The maximum cooling rate and the cooling rate at 300° C. are measured with a circulation rate of 800 Liters per hour.

Quenching medium comprising polymer of	Max Cooling ° C./second	Cooling @ 300° C. ° C./second
Example 1 (control)	135	70
Example 2	135	16
Example 3	166	21
Example 1 + 2 70:30 blend	115	13

The polymer produced in Example 1 serves as a control and is typical of acrylate quenching polymers currently available. The modified polymers of Examples 2 and 3 demonstrate the maximum cooling rate is maintained but a significant reduction in cooling rate at 300° C. is observed enabling the polymers to be suitable for high hardenability quenching.

A synergistic effect is also observed on mixing the modified polymers with the control.

What is claimed is:

1. A process for quenching a heated metal part, which process comprises

preparing a quenching medium comprising

water and

a polyacrylate terpolymer comprising

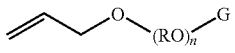
acrylamide and/or methacrylamide monomer units,

acrylic acid and/or methacrylic acid monomer units and

alkyl alkoxylate allyl ether monomer units,

where the acid groups are in the form of an alkali metal salt and

where the alkyl alkoxylate allyl ether monomers are of the formula



where n is an integer from 1 to about 30, R is ethylene, propylene or butylene and G is an alkyl group of 8 to 30 carbon atoms and

immersing the heated metal part in the quenching medium for a period of time to accomplish the quenching.

2. A process according to claim **1** where R is 1,2-ethylene or 1,2-propylene.

3. A process according to claim **1** where n is from about 10 to about 20 and G is an alkyl group of 12 to 24 carbon atoms.

4. A process according to claim **1** where the weight: weight ratio of acrylamide and/or methacrylamide to acrylic acid and/or methacrylic acid monomer units is from about 4:1 to about 1:4.

5. A process according to claim **1** where the weight: weight ratio of acrylamide and/or methacrylamide to acrylic acid and/or methacrylic acid monomer units is from about 2:1 to about 3:1.

6. A process according to claim **1** where the alkyl alkoxylate allyl ether monomer units are up to about 10% by weight of the terpolymer.

7. A process according to claim **1** where the alkyl alkoxylate allyl ether monomer units are up to about 5% by weight of the terpolymer.

8. A process according to claim **1** where the terpolymer has a weight average molecular weight of between about 20,000 and about 80,000.

9. A process according to claim **1** where the terpolymer is between about 0.5% and about 15% of the medium by weight.

10. A process according to claim **1** where the medium further comprises a polymer selected from the group consisting of (acrylamide and/or methacrylamide)/(acrylic acid and/or methacrylic acid) copolymers, poly(alkylene oxide) polymers, polyacrylates, polyvinylpyrrolidone and polyethyloxazoline.

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